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PWA CWA TVA
NPB FEHC

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FEDERAL FUNDS FOR STATE AND LOCAL PLANNING

See page 73

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In THE MUNICIPAL INDEX (the annual reference volume of data and condensed catalogs published by the American City Magazine Corporation) readers will find much material, including lists, and articles on a wide variety of municipal and civic subjects, not published in the monthly issues of the magazine.

See pages 19, 20, 21 and 77 for notices of catalogs and publications on municipal and civic subjects

For Index to Advertisements see page 94

"Aqueduct OF MIRACLES"

MEXICO calls it "Acueducto de los Remedios" because for more than a hundred years (1620-1724) it carried water to the famous Church of Our Lady of Miracles near Mexico City. But the last two centuries have watched it crumbling into a picturesque and romantic ruin that recalls the glory of Old Mexico. Now Modern Mexico looks for its water supply to Layne Pumps and Well Water Systems. Its most progressive cities, including Mexico City, its greatest ranchos, its mines, its industries, know that *Layne* means *more* water at *less* cost, just as does the rest of the world. Send now for Layne's free booklet, "WATER OR NO PAY," which no man interested in water supply should be without.

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AND WELL WATER SYSTEMS

Off the Relief Roll, Onto the Pay Roll

CWA Spending $400,000,000 on Civil Works

TO the NRA (National Recovery Administration) and the PWA (the official initials of the Federal Emergency Administration of Public Works) there was added last month the CWA (as the new Federal Civil Works Administration will be known). The purpose of this new arm of the Federal Government, to which the President has appointed Harry L. Hopkins as Administrator, is to provide regular work on public works at regular wages for unemployed persons able and willing to work. The Board of the PWA has allocated $400,000,000 for this purpose.

The objective of the CWA is the employment of 4,000,000 persons by December 15. On or after December 1 all applications for such employment will be made through the local employment agencies designated by the U. S. Employment Service, and placements will be made in accordance with preferences as set forth in Title II of the National Industrial Recovery Act.

Federal Emergency Relief funds may be used to pay wages to persons transferred from relief rolls to civil works projects. Wherever state and local laws permit, it is urged that state and local relief funds be similarly used. If this is not possible, it is suggested that the funds received from the Federal Emergency Relief Administration be allocated entirely to civil works projects, and state and local relief funds be used for direct relief.

Types of Projects

All public works projects of the character heretofore constructed or carried on either by the public authority or with public aid to serve the interest of the general public are eligible, provided that: (1) they are socially and economically desirable, and (2) they may be undertaken quickly. All civil works projects must be carried on by force account (day labor), and not by contract.

No project which a public body is able to finance under the terms of Title II, of the National Industrial Recovery Act, and the Rules and Regulations thereunder, is acceptable as a civil works project.

The wide variety of local projects for which CWA funds will be available is indicated by the eighty such projects forwarded on November 24 by Administrator Hopkins to the states for immediate consideration. These include one or more of each of the following types of municipal improvements:

Athletic field
Electric transmission line
Flood control
Golf course
Heating plant
Irrigation
Jail
Levee repair
Library building
Municipal power line
Park development
Paving
Pit work
Power plant
Retaining wall
Reservoir pipe line
Road surfacing
Road building
Sewer
School building
School repairs
Sanitary sewer
Street surfacing
Storage building
Stadium
Swimming pool
Storm sewer
Toilets
Telephone system
Town hal
Water works
Water main

"Rules and Regulations No. 1" of the CWA, from which the foregoing information is taken, contains the following instruction as to procedure:

"All civil works projects shall be submitted to the local Civil Works Administration on forms to be furnished by the Federal Civil Works Administration. The local Civil Works Administrations shall submit such applications to the State Civil Works Administration, with recommendations for approval or disapproval. State civil works projects shall be submitted direct to the State Civil Works Administration. The State Civil Works Administration shall approve these projects with such limitations as the Federal Civil Works Administrator may from time to time prescribe or establish.

"Civil works project applications shall contain such data as are required by the Federal Civil Works Administration, and shall be submitted in triplicate to the local Civil Works Administration. Two copies are to be sent by the local Civil Works Administration to the State Civil Works Administration. One copy shall be immediately forwarded by the State Civil Works Administration to the Federal Civil Works Administration.

"In carrying out civil works projects, the Civil Works Administration will use the operating departments of public bodies, except where the Civil Works Administration directly carries out civil works projects.

Hours of Labor, Wage Rates, Etc.

"The hours of labor, wage rates, etc., on civil works projects shall be fixed in accordance with the rules and regulations established by the Federal Emergency Administration of Public Works, as follows:

"1. *30-Hour Week.*—Except in executive, administrative, or supervisory positions, so far as practicable and feasible, no individual directly employed on a civil works project shall be permitted to work more than 30 hours in any one week; provided that the clause shall be construed: (1) to permit working time lost because of inclement weather, or unavoidable delays in any one week to be made up in the succeeding 20 days; (2) to permit the limitation of not more than 130 hours' work in any one calendar month, to be substituted for the requirement of not more than 30 hours' work in any one week on projects in localities where a sufficient amount of labor is not available in the immediate vicinity of the work; and (3) to permit work up to 8 hours a day, or up to 40 hours a week on projects located at points so remote and inaccessible that camps or floating plants are necessary for the housing and boarding of all the labor employed.

"2. No person under 16 years of age shall be employed on civil works projects.

"3. The maximum of human labor shall be used in lieu of machinery wherever practicable and consistent with sound economic and public advantage.

"4. All employees employed in civil works projects shall be paid just and reasonable wages, which shall be compensation sufficient to provide, for the hours of labor as limited, a standard of living in decency and comfort. The Civil Works Administration shall pay not less than the minimum hourly wages for skilled and unskilled labor prescribed by the Federal Administrator of Public Works, viz.:

"That for the purpose of determining wage rates on all construction financed from funds appropriated by the Administrator of Public Works under the authority of the National Industrial Recovery Act, the United States shall be divided into three zones, as follows:

"Southern zone: South Carolina, Georgia, Florida, Arkansas, Alabama, Mississippi, Louisiana, Arizona, Oklahoma, Texas and New Mexico.

"Central zone: Delaware, Maryland, Virginia, Tennessee, Colorado, Utah, California, North Carolina, West Virginia, Kentucky, Missouri, Kansas, Nevada and District of Columbia.

"Northern zone: Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Indiana, Wisconsin, Minnesota, Nebraska, Wyoming, Oregon, South Dakota, Idaho, Pennsylvania, Ohio, Michigan, Illinois, Iowa, North Dakota, Montana and Washington.

"The hourly wage rates to be paid on construction projects in these zones shall not be less than the following:

Southern zone:	
Skilled labor	$1.00
Unskilled labor	.40
Central zone:	
Skilled labor	1.10
Unskilled labor	.45
Northern zone:	
Skilled labor	1.20
Unskilled labor	.50

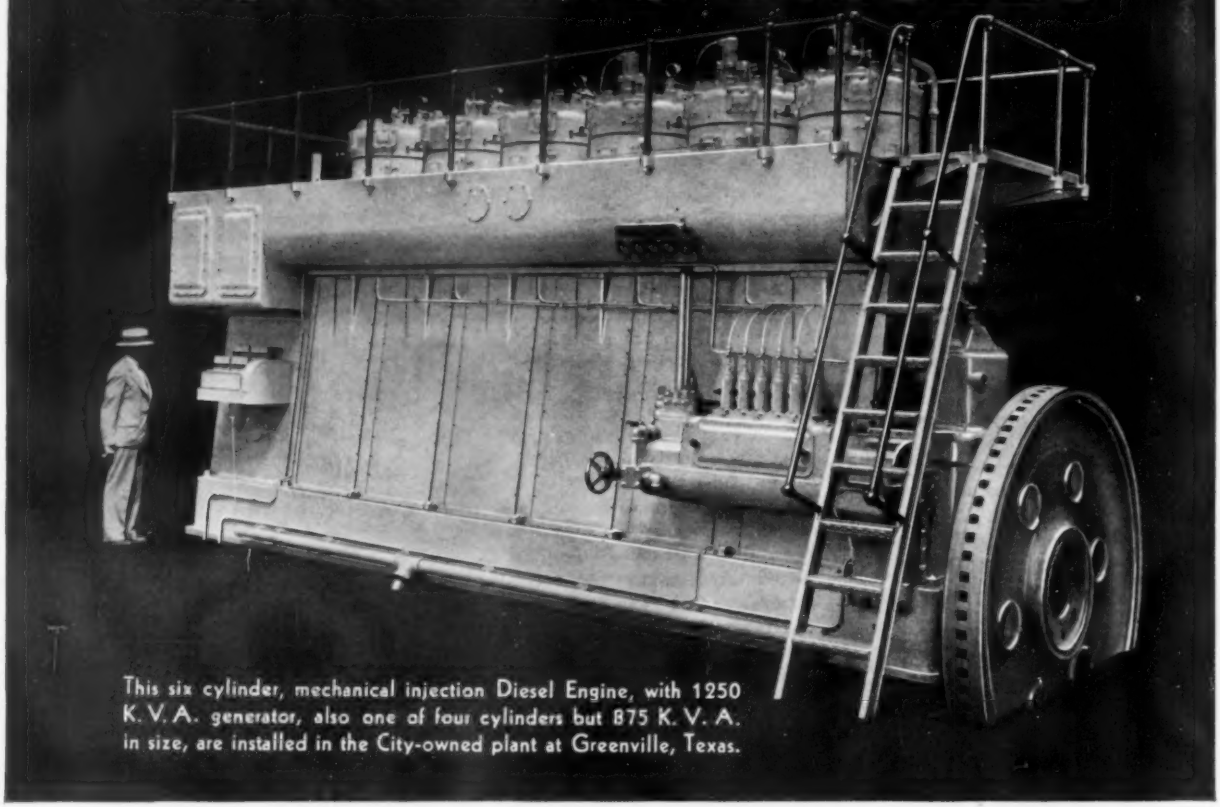
"On road projects the wage rates shall be those which have been fixed by the State Highway Departments, in accordance with Sec. 204c of the National Industrial Recovery Act.

Purchase of Materials

"So far as articles, materials, and supplies produced in the United States are concerned, only articles, materials, and supplies produced under codes of fair competition under Title I of the National Industrial Recovery Act or under the President's Reemployment Agreement, shall be used in the performance of this work, except when the Federal Civil Works Administration certifies that this requirement is not in the public interest or that the consequent cost is unreasonable.

"So far as is practicable, and subject to the provisions of the above paragraph, preference shall also be given to the use of locally produced materials if such does not involve higher cost, inferior quality, or insufficient quantity."

Another Municipality Installs
NORDBERG DIESELS



This six cylinder, mechanical injection Diesel Engine, with 1250 K. V. A. generator, also one of four cylinders but 875 K. V. A. in size, are installed in the City-owned plant at Greenville, Texas.

Here is another city that has turned to the Diesel Engine as the most suitable type of power unit for municipal service. Like many other cities where conditions are similar, Greenville, Texas, has installed modern Nordberg Diesel Engines to replace its steam equipment.

In many installations, not only in municipal plants but serving other industries as well, these engines have demonstrated their ability to produce power cheaply. Besides reducing the cost of power and making greater profits possible, they assure a dependability that is unsurpassed.

Two-cycle engines, arranged for either mechanical or air injection, can be furnished in sizes from 750 horsepower, upward. Four-cycle engines are built in sizes from 150 to 1000 horsepower. There is a Nordberg Diesel of a size and type suited for your needs. May we acquaint you more fully with them?

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Water Supply and Purification

Water-Supply Progress in Indianapolis from Village to Metropolis

As a village, Indianapolis, depended on wells. When fires occurred, a bucket brigade, and later a hand pump, furnished the only fire protection. But in 1860 the town passed 18,000 population and realized it needed water service. In 1865 the Mayor and others attacked the problem and suggested Crown Hill as a reservoir site. The Council adopted a resolution that the city wanted, but should not itself build, water works, and then gave a franchise to R. B. Catherwood and Co. This concern laid a very small amount of pipe, but finally failed.

Other efforts also failed, but in 1869 James O. Woodruff proposed to supply water by means of a pressure system, as contrasted with the reservoir and gravity plan. He and others formed the Water Works Company of Indianapolis, obtained a franchise and began construction. On June 1, 1871, the city, with more than 50,000 population received its first public water service. Wells had been dug, pumps installed, and more than ten miles of mains laid. But despite publicity and the enthusiasm of the company, the response was disappointing.

After a year's operation only 439 properties were connected with the mains, and in 1873, there were only 57 bathtubs with city water connections. Even in 1880, when the population had passed 75,000, less than 1,300 properties took service from the company. With a heavy building program and so few customers, the company failed and was sold at sheriff's sale in 1881 to the Indianapolis Water Co.

The new company, realizing the need of increased facilities, built an infiltration gallery near the confluence of Fall Creek and White River, connecting it with the original station on the east bank of White River through a conduit 30 inches in diameter. Old wells at this station, now abandoned, were the nucleus for the present Washington station, and the infiltration gallery was the beginning of the Riverside station. Washington station pumping equipment was increased and in 1888 this station had a capacity of 22 million gallons of water daily.

Indianapolis, still growing, needed more water, so in 1889 a new 12-million-gallon pumping station was built. Later additions have brought this station to a capacity of 134,500,000 gallons per day. In 1902 the company built a slow sand filter plant having a capacity of 12 million gallons daily. The filtration system has since been developed to 42 million gallons daily capacity. The Fall Creek station was added to the system in 1914 and is now equipped to pump 27 million gallons daily. Deep rock wells at this station supply 6 million gallons daily.

Today's system comprises two filter plants, one low-service pumping station, five high-service pumping stations, three booster pumping stations, five storage reservoirs, 659 miles of mains, and 5,937 public fire hydrants. In 1871 there were only 439 connections, whereas in 1932 there were 70,997 connections for water service.

From "Water Service," published by the Indianapolis Water Co.

Causes of Different Types of Breaks in Water Mains

A FREQUENT source of leakage in water mains is breaks. They are of several types. One is a tranverse break in which the pipe is broken entirely across. This is almost always caused by a hard spot, usually a stone or a piece of rock, under the point of breakage, with a softer foundation on each side allowing uneven settlement.

A crack in the spigot end is usually caused by careless handling of the pipe during transportation or laying. Since it is held firmly in the bell, there is not much chance for the split to spread under pressure; but under certain conditions a considerable amount of water can escape from such a crack.

A crack in the bell end is more serious and may be caused by careless handling, but too heavy calking may also make the crack. Such a crack tends to open up under pressure and may run back into the pipe, causing serious leakage from the crack itself or from a hole which may break out along the original crack.

A large piece broken out of a pipe may be due to a crack as mentioned above or to some inherent weakness which makes itself known under some unusually great stress such as water-hammer. In such a case the whole line may be subjected to stresses considerably above the nominal limit of the pipe and if there is a defect or weak point, failure at that point is liable to occur.

Holes are often found in pipe and may be due to sand holes, corrosion, electrolysis or erosion. Sand holes are not easy to find after the pipe is coated. They are rarely the cause of leakage, since the area of the hole is small, and the iron, while thinner at that point than it should be, is still of sufficient strength to hold the pressure. Also, it is not usual to find holes in cast iron pipe caused by corrosion, except in cases where the main is laid in very corrosive soil. Holes in mains due to stray electric currents have in the past caused considerable leakage, but electroysis surveys in recent years have done much to eliminate this source of trouble. In some soils where sharp sand is present, a slight pinhole leak, especially in a joint, may cause considerable leakage, since the sand and water exercise a severe erosive action if the stream hits the pipe. Such erosion has an appearance similar to the deterioration caused by electrolysis. While it does occur in cast iron mains, it is more often seen in lead services or in brass cocks and goosenecks.

Defective pipes may be the cause of leaks. The sand holes have been mentioned, but are of small importance. In the early days pipes were perhaps never entirely concentric, and one side was much thinner than the other. Many of these pipes have stood up under considerably greater pressure than was expected, but sometimes one breaks owing to lack of metal in the weak side.

—From a paper by Alfred E. Skinner, Western Manager, The Pitometer Co., presented before the American Water Works Association.

Iron and Lime in the Removal of Manganese from Providence Water

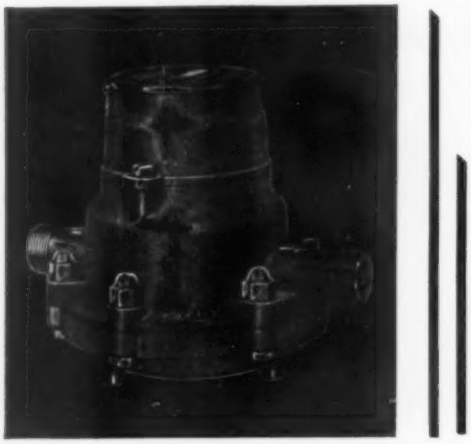
MANGANESE is completely removed from the soft, colored raw water at Providence, R. I., by copperas and lime treatment, maintaining a pH of about 10 for coagulation. The treatment has stopped red-water and manganese troubles in the distribution system and eliminated the necessity of using bleeders or dead-ends. Increases in color, hardness and iron in the effluent over the amounts contained in the effluent under alum treatment have not been of sufficient magnitude to cause concern to any except some industrial users who note the hardness change.

The use of bottom water from the reservoir has been helpful to coagulation during stagnation periods. It produces a water of fairly uniform low temperature throughout the year. It has so far been free at all times from tastes and odors such as are present in the upper waters due to algae. Filter operation is satisfactory and no trouble has been experienced in keeping the filters clean. Analyses show that the coating of sand grains has been negligible in twelve months of copperas-lime treatment.

Experience at Providence has been that granular copperas will cake when stored in bins or bags and tends to introduce dosing irregularities with dry feed equipment. Experiments indicate better coagulation and settling with ferric coagulants than with those in the ferrous form.

—From a paper by E. C. Craig, E. L. Bean and R. W. Sawyer, presented before the American Water Works Association.

See the 1933 Municipal Index, pages 247-252, for Statistics of Water-Works Systems in Cities of Over 10,000 Population



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The "Plus" quality in American and Niagara Water Meters

Each part in a water meter must be well designed, finely built, if the meter is to give reasonable service. But an aggregation of fine parts is not enough to assure truly fine performance. It requires something "plus." *Balanced design* is essential!

Just as the well-rounded football team will outplay and defeat a collection of opposing stars who "play to the grandstands," so will perfect team-play of all parts in a water meter give the extra accuracy and added life that you are looking for. This you get in American or Niagara Meters.

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Established 1892

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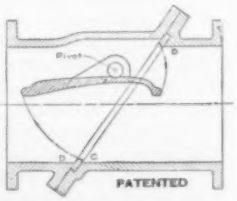
Less MAINTENANCE

WITH *Chapman* NON-SLAM *Check valves*

THE continuous swing and flutter of the disc of an ordinary check valve cause constant wear that results in frequent replacement of hinge pins and bearings. The balanced disc of the CHAPMAN Non-Slam Check Valve rides smoothly and steadily with the flow and practically eliminates the wear of parts.

The CHAPMAN Non-Slam Check Valve operates equally well in a vertical or horizontal position and closes drop tight without slamming.

Tested for more than two years under severe operating conditions in actual service, there are now hundreds of these valves in use in water, air and gas lines. Write for illustrated booklet describing the many advantages of CHAPMAN Non-Slam Check Valves.



The disc, balanced and supported on two bearings, moves through a short arc, closes quickly.

THE CHAPMAN VALVE MANUFACTURING CO.

INDIAN ORCHARD, MASSACHUSETTS

Water Meters Check Revenue Losses

Franklin, N. H.

THE present population of Franklin is 6,500. With 98 per cent of the services metered, the average daily consumption is 45 gallons per capita. While there are no records showing the reduction in consumption through metering, it is definitely known that there has been a great saving in water due to the installation of meters.—E. J. JUDKINS, Superintendent.

Roswell, N. Mex.

THERE has been an apparent increase in per capita water consumption in Roswell, which has been 100 per cent metered since 1910, which is the first year of record, and the increased consumption has been due entirely to the number of city parks which have been improved since 1930. The population of Roswell in 1910 was 6,172, and from that date on all services have been 100 per cent metered. There was no record of the per capita consumption in 1910. In 1920 the population had increased to 7,033 and the average daily per capita consumption was 100 gallons. In 1930 the population had increased to 11,250 and the average daily consumption to 139 gallons per capita. The population in 1932 was 11,500 and the per capita consumption 163 gallons daily.—LEA ROWLAND, City Engineer and Superintendent of Water.

Henryetta, Okla.

THE water works of Henryetta were built in 1910. In the period from 1916 to 1925, when the population was about 12,000 and all services were metered, the consumption was 120 gallons per capita daily due to the furnishing of large quantities of water for smelters and oil development as well as for the local coal production industry. In 1930 the population had dropped to 7,500, and with all services metered the consumption was 55 gallons per capita daily. These figures were also true for 1932.—H. M. LARUE, Engineer, Seminole Producers Association.

Meadville, Pa.

BEFORE the installation of meters began in 1910, the quarterly flat-rate charge for an eight-room house with toilet and bath and outside connection for sprinkling in Meadville was $4.50. In 1932 the average quarterly bill for domestic service through meters was $2.95. Universal metering caused a reduction in the gross earnings of the Water Department, but the net earnings were not affected. The population of Meadville in 1900 was 10,590, there were no meters, and the consumption was 195 gallons per capita daily. In 1910, with a population of 12,780 and 40 per cent of the domestic and industrial services metered, the consumption had dropped to 127 gallons per capita daily. In 1920 the population was 14,568, the services were 100 per cent metered and the consumption 114 gallons per capita daily. In 1930 the population had increased to 16,595, all of the services were metered and the consumption still further reduced to 107 gallons per capita daily.—HARRY ELLSWORTH, Superintendent.

Memphis, Tenn.

MEMPHIS has a record of a constantly reduced daily consumption with increasing population and with an increasing per cent of the services metered, in spite of the fact that during the period covered from 1903 to 1931 the quality of the water had been greatly improved, which usually results in an increased consumption. In 1903, when the population was 102,320, the services were 15.37 per cent metered and the daily consumption was 124 gallons per capita. In 1910 the population was 131,105, the services were 46.21 per cent metered and the consumption was 103 gallons per capita daily. In 1920 the population had increased to 162,351, the services were 82.75 per cent metered, and the consumption had dropped to 91 gallons per capita daily. In 1930 the population was 252,059, the services were 99.32 per cent metered and the consumption was 78 gallons per capita daily. The population and per cent of services metered in 1931 was the same, but the consumption dropped to 74 gallons per capita daily.

Dallas, Texas

THE water services of Dallas have been 100 per cent metered since 1913, and the per capita consumption has been cut in half. It is not possible to readily figure the actual cash saving to the city by universal metering, for the rates have been reduced a number of times because of the economy of operation of the Water Department. In 1910, when the population of Dallas was 92,104 and very few of the services were metered, the consumption was approximately 125 gallons per capita daily. In 1920, with a population nearly doubled, to 189,284 and the services 100 per cent metered, the consumption was reduced to 63 gallons. It is interesting to note that this figure is lower than for the next two years, probably due to a personal reduction in the use of water through the fear of high rates when the meters were installed. This is a frequent occurrence when universal metering is done over a short period of time. In 1930 the population was 309,658, the services were 100 per cent metered and the consumption was 85 gallons per capita daily. In 1932, with a population of 320,000 and all services metered, the consumption had dropped to 71 gallons per capita daily.—J. B. WINDER, Superintendent, Water Works.

Richmond, Va.

A COMPARISON of the quantity of water pumped, the cash receipts, the population and the receipts per million gallons in Richmond gives a very interesting picture of the value of metering, particularly when it is realized that only 2 per cent of the services were metered in 1891 and 100 per cent were metered in 1930.

	1891	1930
Water pumped (gals.)	5,000,000,000	7,000,000,000
Population	81,736	182,929
Total receipts	$134,857.49	$676,454.90
Receipts per million gallons	$26.97	$96.97
Per cent of services metered	2%	100%

In 1891 the average daily consumption per capita was 167 gallons. This was reduced to 126 gallons in 1904, when 40 per cent of the services were metered and the population was 102,078. A further reduction to 97 gallons per capita daily occurred in 1910, with 68 per cent of the services metered and a population of 127,626. The consumption remained identical for 1920, when the services were 80 per cent metered and the population had increased to 175,000. In 1924, with a population of 178,200 and 92 per cent of the services metered, the consumption had increased slightly, to 113 gallons per capita daily. This, however, was reduced to 106 gallons daily with 100 per cent metering in 1930, when the population was 182,929.—GEORGE H. WHITFIELD, Director of Public Utilities.

Sheboygan, Wis.

A NOTICEABLE decrease in daily per capita consumption has been evidenced in Sheboygan since about 1925. The consumption figure for 1910 is low, owing to the fact that many inhabitants did not take service at that time. The population of Sheboygan in 1910 was 26,398, the domestic services were 5.5 per cent and the industrial services 100 per cent metered. The consumption was 104 gallons per capita daily. In 1920 the population was 30,955, the domestic services were 19.5 per cent metered and the industrial services 100 per cent metered, with a per capita consumption of 152 gallons daily. In 1930 the population had increased to 39,251, the domestic services were 60 per cent and the industrial services 100 per cent metered, and the per capita consumption, which had reached a peak in 1925 of 175 gallons daily, had been reduced to 155 gallons per capita daily. In 1931 the population was the same as in the previous year, but the domestic services were 65 per cent metered, the industrial services remained 100 per cent metered and the per capita consumption had been noticeably reduced, to 142 gallons daily.—ARTHUR H. MILLER, Superintendent, Water Department.

Brick Paved Ohio River Road
Jefferson County, Ohio

IT TAKES MORE MEN TO BUILD A BRICK PAVEMENT—BUT IT IS LESS EXPENSIVE IN THE LONG RUN

NATURALLY it takes more men to construct a brick pavement. There is more *to* a brick pavement than less enduring kinds. Then too, the actual laying of the brick is hand labor. ¶Not only will new brick pavements and brick resurface jobs put more men to work now, but the long-wearing, low-maintenance of brick pavements will save money for years to come. ¶Brick pavements always prove less expensive in the long run.

● *For further information, write National Paving Brick Association, 1245 National Press Building, Washington, D. C.*

BRICK PAVEMENTS

FACE THE FUTURE—PAVE WITH BRICK

During December we hope you will remember to mention THE AMERICAN CITY.

Engineering-Street Cleaning-Highways

The Public Works of Oak Park, Ill.

THE village of Oak Park, Ill., was established November 5, 1901, and the present population is 67,500 and the area 4.5 square miles. The village has 107.86 miles of streets, of which 107.75 miles are paved, and 50.97 miles of alleys, of which 49.24 miles are paved. There are 90.24 miles of sewers, 200 miles of sidewalks, and 107 miles of water mains. The village has one 5,000,000-gallon water reservoir and 1,206 fire hydrants.

There are five playgrounds, totaling 9.8 acres, and nine parks, totaling 62 acres. The streets of the village are illuminated by 4,050 street lights and are lined with 25,000 street trees. The refuse of the community is disposed of in a Nye odorless incinerator with a capacity of 10 tons per hour.

DUDLEY C. MEYERS,
Commissioner of Public Works, Oak Park, Ill.

Wayne County, N. Y., Favors Highway Contract Work

CONSIDERABLE saving in the cost of local highways has been effected in Wayne County since the abandonment of the day labor method and the adoption of the competitive contract method of performing this work. A saving of more than $5,000 per mile for 1932 road work, as compared with the cost for work performed in 1929, has been noted. The county records show an average cost of $15,000 per mile under the day labor system in 1929, for roads 12 and 14 feet wide, whereas under the contract system in 1932 the average cost was $9,800 per mile for roads 14, 16 and 18 feet in width.

Day labor was abandoned by Wayne County in 1929, and practically all county work performed during 1930, 1931 and 1932 was done by the competitive contract method. The cost per mile to the county has dropped each year, whereas under the day labor system the cost of county highway construction had been increasing.

R. L. BARNES,
Superintendent of Highways, Lyons, Wayne County, N. Y.

County Saves 33 Per Cent by Contract Work on Highways

ONTARIO COUNTY, N. Y., is definitely committed to the contract system of conducting highway work as opposed to the day labor or force account method. The contract system is favored because of the large economies which that system has revealed during the last two years, when both the contract system and the force account method were employed on a program which involved a total of nearly a million dollars expenditure during 1932 alone. It was found that, with no difference in quality, the contract projects were built for one-third less than by force account. It therefore seems to the advantage of the county to continue the contract practice where the projects are large enough to warrant such procedure.

Careful cost records were kept on both systems of work for the two-year period. During the last year contractors were required to employ local workers wherever possible. Careful observation revealed that 90 per cent of the workers were residents of the county.

GORDON S. CHESTER,
County Highway Superintendent, Canandaigua, Ontario County, N. Y.

Street Cleaning in Toronto by Flushing

DURING the summer of 1932, five flushers were in operation, in Toronto, Ont., two of which were electric and worked nightly in the downtown section. Three gasoline power flushers worked generally on the main thoroughfares, and on special assignments in the vicinity of excavation or construction work in progress.

Street flushing is a most essential service, and is the only method for removing the fine dust and dirt which escapes the patrolman's broom. Owing to limited equipment, this service has been curtailed to the point where it is possible to flush regularly only a very small area. A most desirable condition would exist if the necessary equipment were available to flush every street at least twice weekly. It is not only the most economical method of street cleaning, but is most effective, and could be done during the night with little interruption from traffic and parked vehicles.

COST AND QUANTITIES—STREET FLUSHING
1919-1932

Year	Street Mileage Flushed	Quantity of Water Used (Gals.)	Total Cost	Cost per Mile
1919	1,670	8,546,750	$5,639.53	$3.44
1920	3,169	15,435,000	9,681.52	3.05
1921	3,834	20,591,900	12,606.80	3.29
1922	7,156	35,100,100	21,713.89	3.03
1923	3,865	22,267,300	13,781.95	3.56
1924	3,332	18,355,600	11,810.38	3.54
1925	1,702	10,830,950	6,225.94	3.65
1926	1,615	8,950,000	5,255.41	3.25
1927	1,294	7,173,550	4,195.93	3.24
1928	2,002	9,563,600	6,379.65	3.18
1929	2,740	15,229,000	8,427.82	3.07
1930	3,931	20,230,000	12,809.06	3.26
1931	6,037	34,392,000	18,090.76	3.16
1932	4,492	25,465,000	14,314.45	3.18

GEORGE W. DIES,
Street Commissioner.

Significance of the American Road Builders' Association Convention in January, 1934

THE American Road Builders' Association has announced that its 31st Annual Convention and Exhibit will be held in the Stevens Hotel, Chicago, during the week of January 22. At a time when the highway program hangs in a balance, the Convention is of unusual significance. The Association's national program to bring before the public the necessity for a continued highway program will be launched at this winter's Convention. The campaign will stress the vital necessity for restricting the expenditure of gasoline and motor-vehicle revenues to highway and street budgets.

The Convention will bring before the general public the demand for continued participation of the Federal Government in the highway program. It is intended to show the public that there still remain 75,000 miles of state highway road systems which never have been improved and that 2,400,000 miles of "mud" roads continue to be the sole outlet for more than 3,000,000 farms. The congestion in municipal centers is proof of the need for arterial highways through such centers and for belt lines around all the larger cities.

Traffic volume increases in recent years have greatly overtaxed the old system built to cope merely with the demands of a decade or more ago, and the question of modernization and widening will be carefully studied by engineers and officials who will meet at the convention in Chicago.

The County Highway Officials' Division and City Officials' Division will hold their special sessions, and the Road Builders' Exhibit will be held during the entire Convention in the Exhibit Hall of the Stevens Hotel, this being the first time in many years that the Annual Road Show has been held under the same roof as the Convention.

The Municipal Index for 1933
contains, on pages 187-189, important material on Snow Removal Organization, of timely interest.

Bituminous Macadam—Cost and Construction in New York State in 1932

Name of Municipality	Price per Sq. Yd. (Exclusive of Grading and Excavation)	Thickness of Macadam	Gallons per Sq. Yd.	Methods Used
Amsterdam	$.91	6″	2.5	Penetration
Newburgh	.91*	4″	1.75	Penetration
	1.25*	6″	1.75	Penetration
Poughkeepsie	1.45	6″	3	Pressure distributor
Yonkers	1.37	6″	2.5	Penetration
Bronxville	1.10	4″	2.25	Penetration
Garden City	1.20	5″	2.5	Pressure
Massena	1.10	2½″ compact on 10″ gravel base		Tarvialithic
Ossining	1.10	3″	2.50	

*Includes grading.
From data gathered by the New York State Bureau of Municipal Information.

No Doles for Them!

They'll work right through the winter on a . . . . . Sewage Disposal Plant

Winter Construction of a Sewage Disposal Plant or Sewer Extension Project is not only practical, it is *desirable.*

Build now—straight through the winter. Provide work for many men who would otherwise fall back on doles. . .

Build now. Have the plant operating before the danger time of next summer. Free your streams and beaches forever from the danger of epidemics arising from pollution by sewage.

The Federal Government is ready to help you. We will help you, too, by furnishing you with all the information that you need on planning and protecting the work so that it can be carried on all winter. . . . Write us.

Practically all types of concrete construction can be carried on through the winter. Much commercial building has been, and there is no reason why public works should not be.

This applies not only to sewage disposal plants, but to many other types of buildings, curb and gutter work, bridges, ramps and piers. In almost all cases it is possible to plan and protect the work, so that the construction can proceed as simply and as efficiently as in summer.

It has been proved that when cash was the incentive—when it was necessary to rush buildings to completion—for the sake of revenue—winter did not hold up construction. Now with a greater issue—the relief of human suffering—the same program should be applied to public works.

We can help you—with information as to planning or protecting the work, and should your conditions make it impractical, we will frankly tell you so.

FOR FURTHER INFORMATION WRITE THE CEMENT SERVICE MAN, CARE OF:

PORTLAND CEMENT ASSOCIATION
Room 2312
33 West Grand Avenue
CHICAGO

85 to 90% of the money spent on Concrete Construction Goes to Labor

Sewerage and Sewage Disposal

Gas Hazards in Sewage Plant Operation

CARBON monoxide, which accounts for repeated fatalities caused by running cars in closed garages, may be encountered with the new practice of burning gas at sewage treatment plants, a possibility here being the escape of vapors that have not undergone complete combustion. From gas analyses which have been made, however, it appears that carbon monoxide is not present in gas from digested sludge in the extremely dangerous proportions found in coal gas. Sometimes leaks from city gas mains will flood valve pits, etc., with carbon monoxide. The hazards from this source may be slight at most treatment works, but it is worth while for operators to consider this danger, especially since it is quite common for operators of small plants, particularly, to do emergency work on other parts of the sewer system and on jobs even less related to their usual work.

Hydrogen sulphide is not generally understood to be much deadlier than carbon monoxide, but such is the case, for equal concentrations; and, furthermore, its odor cannot be depended upon for a warning that dangerous concentrations have been reached. It is not uncommon in attempted rescue of a man who has gone into a tank, sewer or pit and become unconscious, that the rescuer himself has succumbed. One instance has been reported where four persons met this fate in quick succession. Hydrogen sulphide has been the cause in some of the cases, carbon monoxide in others.

Victims of hydrogen sulphide poisoning need to be brought out into the air as soon as possible. Victims of carbon monoxide poisoning should immediately and continuously be given artificial respiration by the prone pressure method, with which all persons should be familiar to a degree that would enable them to apply it anywhere. The prone pressure method is applicable in cases of electric shock, drowning and hydrogen sulphide poisoning.

Gas and electric companies of the larger cities maintain artificial respiratory equipment which may be borrowed in emergency. Operators ought to know where this can be obtained on short notice, also where gas masks and oxygen breathing apparatus may be obtained for emergency use, as, for example, in order to enter an enclosure where chlorine has escaped. Medium to large sewer plants would do well to maintain some of this equipment. There is a hip-pocket device which is cheap and handy, known as the self-rescuer. It is simply placed in the mouth, the nose being clipped shut. It is good for about 20 minutes, but unless especially charged for carbon monoxide, is useless against this gas. Miscellaneous sponges and cloths are of little use, and a precautionary word should be said against the indiscriminate use of any piece of equipment as protection against all gases. The equipment's protective capacity should be ascertained beforehand. The Mine Safety Appliances' All-Service Gas Mask can be used for ordinary concentrations of the gases we have been discussing. Army masks are usually not designed against carbon monoxide.

—From a paper presented by CHARLES L. POOL, Chief Engineer, Rhode Island Public Commission, and E. C. JOHNSON, Chief Engineer, Rhode Island Board of Purification of Waters, before the New England Sewage Works Association.

Reconditioning Sewage in a Separate Digester

THE village of Fairport, N. Y., population 4,800, operates its own electric light and water plants at a profit. In 1913 fourteen acres of land were purchased and a $6,500 sewage treatment plant erected on the site. The plant consisted of grit chambers, a sedimentation tank and sludge drying beds. In 1929, $77,500 was appropriated for the remodeling and enlarging of the treatment plant, trickling filters were constructed, a final settling tank was built, and a separate sludge digester was erected.

The sludge digester is 38 feet in diameter with a cone-shaped bottom. The tank extends 9 feet below ground level and 13 feet into the air. No means were provided for stirring or agitating the sludge within the digester. A 4-foot square steel gas dome is in the center of the top. The supernatant liquor drains to the sludge drying beds. This caused odors in the summer, and in the winter transformed the drying beds into ponds of ice. After the first winter, the liquor line was changed, so that the supernatant liquor was discharged into the incoming raw sewage.

A Marlow piston pump with a capacity of 4,800 gallons per hour was installed on the top of the digester, so placed as to pump the sludge from the bottom of the middle of the tank, forcing it out at the top of the digester about 10 feet from the center. A brick house was constructed for the pump, and it was found to be large enough for a small laboratory. When chemicals are added to condition the sludge, the pump is invaluable for mixing.

After starting the new plant, in 1930, it was discovered that the sewage contained industrial wastes from two sources, one of which was quickly eliminated. An effort was made to treat the other industrial waste at the plant, but without success. Time after time the sludge was conditioned, using soda ash, lime and ammonia, bringing the pH up to as high as 7.6 to 7.8, only to see it drop back in the course of a few days to 6.6, 5.6 and 5.0 or even lower.

After the elimination of industrial waste early in May, 1932, all but 8 feet of the sludge in the digester was drawn off. The remaining sludge was treated with milk of lime and well mixed by the sludge pump. Since that time small amounts of lime have been added two or three times a week to the sludge in the digester. Ripe sludge was also added four different times for seeding. A very slow but constant improvement in the condition of the sludge was noticeable throughout the summer.

A study of the temperature inside the digester was begun the first of August. A very slow rise in temperature within the digester continued during August and until September 30, when it was 62 degrees Fahrenheit, the highest temperature for the year.

In the fall about 4 feet of sludge went to the top of the digester. It was very dark gray in color, fluffy and porous in appearance. A large amount of gas was formed, which passed into the air. Small amounts of sludge were drawn from the digester to the drying beds each time fresh solids were added, because of this floating mass of sludge. The sludge once on the drying beds dried readily in spite of the fact that it was not completely digested.

Since May, 1932, there has been a slow, steady improvement in the condition of the sludge in the separate digester. The sludge moisture is being reduced gradually. The pH value is slowly climbing. The odor has been substantially reduced. The color of the sludge is becoming darker and darker.

—From a paper presented by F. ARTHUR CARY, Superintendent of Public Works, Fairport, N. Y., before the New York State Sewage Works Association.

A New Name for Open Storm Sewers

ANYTHING that has the name "sewer" attached to it naturally causes the house owner to turn up his nose. A storm sewer, if fully enclosed and out of sight, causes him no worry, but if storm water is diverted from streets into open channels or streams and is referred to as an open storm sewer, he begins to think he smells sewage.

As a means of overcoming this objection, which is purely mental, certain city planning groups, particularly in St. Louis, Mo., have invented the term "floways" to designate streams or open storm sewers, particularly where they flow through congested districts of municipalities. It is a more euphonious name and seems to appeal to the public.

See "Sewer Financing in Massachusetts," by Paul F. Howard, on pages 343-348, The Municipal Index for 1933.

Who starts things in your town?

• Now is the time of times to build a public water supply system or to make needed improvements to an existing system.

The National Recovery Act provides for a direct grant to the community of up to thirty per cent of the cost of labor and materials, and a loan of the balance of the cost at a low interest rate.

Community leaders who fail to take action now may never again be able to finance public water supply projects so easily and on such favorable terms.

Water supply systems are self-supporting, largely because of the long life and low maintenance cost of cast iron mains. In England, France, Germany and America, cast iron mains installed more than a century ago are still in service. The investment in those mains was liquidated generations ago—yet they go on serving, saving and earning in the community interest.

This Association will be glad to cooperate with community leaders by furnishing free literature helpful in stimulating public interest. Please address The Cast Iron Pipe Research Association, Thomas F. Wolfe, Research Engineer, 309 Peoples Gas Bldg., Chicago, Ill.

WATER WORKS IMPROVEMENTS ARE AN INVESTMENT, NOT AN EXPENSE

Collection and Disposal of Municipal Refuse

Waste Collection and Disposal in Oak Park, Ill.

ALL garbage and other waste collections are made by the Street Department in Oak Park, Ill. Garbage and combustible waste are hauled to the Nye odorless garbage incinerator on North Boulevard near East Avenue. Ashes, tin cans, street sweepings and incombustible waste are hauled to a dump. The collection equipment and force consist of seventeen men, two 1-ton Ford trucks, three semi-trailers with a 1-ton Ford tractor and two Highway trailers, working nine hours per day. Collections of garbage are made twice a week excepting when prevented by bad weather.

In 1932 the incinerator was operated thirteen hours per day excepting on Saturdays, Sundays and holidays. It is operated by five men; two of these working on the charging floor, one in the furnace room during the day, and two working at night finishing the burning of the garbage and cleaning the furnaces and building. The men working on the collection and disposal of garbage were on a 5-day schedule in 1932. Most of the leaves from the streets were burned in the incinerator.

In addition to the garbage and combustible waste collected by the Street Department, a considerable amount of combustible rubbish and waste material from hotels, restaurants, markets, fruit stores, etc., is brought to the incinerator by the equipment of these firms. The combustible refuse collected by village teams and that brought in by the stores furnish practically all the fuel needed for the burning of the garbage. When the garbage is very wet, or when the amount of combustible materials collected is not large, it is necessary to burn some coal.

Improvement was made in the garbage collection service in 1932 by the purchase of additional equipment consisting of three drop-frame semi-trailers equipped with 8-cubic-yard bodies, portiere canvas cover and a fifth wheel for truck haulage, and 2-team tongue dollies equipped with fifth wheels. A tractor for these trailers was provided by using one of the 1½-ton Ford trucks. This equipment eliminated three one-horse garbage carts which had been in use for some twenty years, and one dump wagon, and permitted the return of one trailer to the ash collection service. This additional equipment is sufficient for the collection of all waste materials and permits of more regular and frequent collection service.

Village teams and trucks collected 11,372.5 tons of garbage and combustible waste, including 1,819 cats and dogs in 1932. Grocers, market men, etc., brought 1,408.7 tons of garbage to the incinerator. An average of 42.32 tons was burned per day for 302 working days. The cost of collection and disposal in 1932 is shown in the following table:

Collection

Labor	$24,133.51
Teams and trucks	4,520.45
Supplies and repairs	446.56
Superintendence	1,285.55
Hired teams	12.00
	$30,398.07

Cost per ton—$2,378

Disposal

Coal	$1,137.50
Labor	6,191.75
Teams and trucks	157.05
Supplies and repairs	498.22
Superintendence	329.15
Light and power	709.14
	$9,022.81

Cost per ton—$.706

Total cost of collection and disposal of all garbage and combustible waste, $39,420.88.

DUDLEY C. MEYERS,
Commissioner of Public Works, Oak Park, Ill.

Increased Collection at Reduced Cost

THE city of Sioux City, Iowa, showed an increase in the number of tons of garbage, rubbish and ashes collected for the fiscal year ending March 31, 1933, at a reduced collection cost from the preceding year. It has been generally felt that the depression and unemployment would decrease the collection. The increased number of loads collected by the Department of Sanitation demonstrates that the people have been well fed and warmly housed even though employment was below normal.

The comparative expenses for 1932 and 31 are as follows::

	1932	1931
Total expenses	$48,992.81	$50,485.20
Cost per ton	1.69	1.88½
Cost per yard	.77	.85
Cost per capita	.61¼	.63

There were 5,838 loads of garbage collected, equivalent to 17,514 cubic yards or 8,757 tons. There were also collected 11,572 loads of rubbish and ashes, equivalent to 46,288 yards or 20,251 tons. The total cost of the collection and disposal of garbage, rubbish, ashes and dead animals amounted to $48,992.81 during the fiscal year ending March 31, 1933.

W. H. CARRIGG,
Superintendent, Department of Sanitation.

Collection Costs at Wilmette, Ill.

DURING 1932, the village of Wilmette, Ill., collected 26,983 tons of garbage and combustible waste by contract at a cost of $10,500, or $3.89 per ton. The village has recently let a new contract for the collection of garbage and combustible waste for 1933 at a cost of $7,800, a reduction of 25 per cent on the 1932 contract. The new contract calls for three collections per week during the five summer months, and two collections per week during the other seven months, and also provides for a daily collection at the business houses in the main business sections. Wilmette is a residential suburb of Chicago, and has a population of approximately 15,500. All garbage is hauled to the municipal incinerator and disposed of there. The average haul is approximately 2½ miles.

C. M. OSBORN,
Village Manager.

Contract Collection Vetoed in New Rochelle, N. Y.

NEW ROCHELLE, a city of 60,000, became a city manager city about two years ago, at which time the collection of refuse and garbage was placed under contract. Having had, previously, a sad experience with contract collection, the city drew up rigid and detailed specifications which withstood all legal opposition. Some of the outstanding conditions of the specifications and contract were that bidders were required to prequalify by answering a questionnaire on previous experience, competency and recommendations. The contractor was also required to have five years' experience. A bill of sale and affidavit of ownership making over to the city for duration of the contract all of the contractor's equipment also was required. A cash security was required to be deposited with the city, together with a regular performance bond, and the contract exacted penalties for non-performance.

At first the city was congratulated on the specifications by local contractors who thought they could qualify under the provisions of the contract. Later these contractors found that they were unable to raise the deposit money to pay for the necessary equipment, and to secure the bond, and also lacked the required experience. This led to a feeling that there was discrimination against local contractors, and many criticisms and accusations were made. The bids were received and opened and it was found that no contractor residing in the city submitted an estimate. This aroused public sentiment so that an injunction was brought against the city to restrain it from awarding the contract. This injunction was denied. However, because of public opinion and the action of the City Council, the contract was not awarded and the city continued to operate its own refuse collection.

All municipal governments are so constituted that pressure may be brought to bear to increase the cost of collection under municipal operation in spite of the head of the department, while under the contract system once the contract is awarded very little can be done to effect an increase in cost during the life of the contract. A concrete example of this situation has taken place in New Rochelle. The cost of collection operations actually increased until it reached $203,000 in 1931, excluding so-called overhead and depreciation. This, however, has been reduced to about $130,000 for 1933 by exercising the strictest economy.

ACKNOWLEDGMENT.—From a discussion on "Contract versus Municipal Collection of Refuse," by Bert J. Young, New Rochelle, N. Y.

WINCHESTER SCHOOLHOUSE *Saved from Water Damage by* PROMPT ALARM *from Gamewell* SPRINKLER WATCHMAN

TOWN OF WINCHESTER
MIDDLESEX COUNTY, MASSACHUSETTS

HEADQUARTERS, FIRE DEPARTMENT
32-40 MT. VERNON STREET

DAVID H. DeCOURCY
CHIEF

The Gamewell Company
Newton
Massachusetts

Gentlemen:

In 1929 we installed one of your Master Fire Alarm boxes at our Senior High School, and connected it to the sprinkler system in the building thru your Sprinkler Watchman equipment.

On the morning of November 28, 1932 with 700 students in the building an alarm was received at fire headquarters at 8:37 o'clock. Simultaneously the fire alarm system sounded within the school causing the pupils to file out in an orderly fire drill manner. Reaching the scene before all the students had filed out, we found the sprinkler system had frozen during the zero weather the night before causing a pipe to burst in the new auditorium when the heat reached it shortly after the opening of school.

The instant alarm given by your Sprinkler Watchman connection enabled us to reach the school within a minute after the water flow started and to shut off the water before it spread around the auditorium. Only a small loss resulted, but had the water flow continued any longer, there would have been much greater damage.

This incident was a practical demonstration of the value of your Sprinkler Watchman in keeping down water loss. I have repeatedly recommended this protection for public and other buildings.

Yours very truly,

David H. DeCourcy.

Chief of Fire Department

THE good judgment of Fire Chief David H. DeCourcy of Winchester, Mass., in hooking up a schoolhouse sprinkler system with his fire department through a Gamewell master type fire alarm box — SPRINKLER WATCHMAN —saved his town thousands of dollars in water damage. And it brought his firemen to the school before the students had all filed out following the alarm. There is no better safeguard to life in sprinklered property than the Gamewell SPRINKLER WATCHMAN.

NRA MEMBER U.S. WE DO OUR PART

THE GAMEWELL COMPANY
NEWTON, MASSACHUSETTS
"A Box A Block"

Public Utilities – Public Safety

How Public Utilities Have Fared in Recent Elections

INFLUENCED by the prospect of obtaining low-cost wholesale power from the Federal Government plant at Muscle Shoals, a number of cities in the general vicinity of that project voted during the fall months on propositions for the construction or acquisition of municipal electric distributing systems. Up to the early part of November a dozen small cities in Alabama approved such projects; they were Andalusia, Bessemer, Decatur, Florence, Guntersville, Hartselle, Martsville, Muscle Shoals, Oneonta, Sheffield, Tarrant City and Tuscumbia. However, Birmingham, the largest city of the state (260,000 population), on October 9 by a light vote, 10,034 to 7,004, rejected the proposal to acquire or build electric facilities which would utilize energy from Muscle Shoals. Other proposals to acquire or build water, street-railway and steam-heat facilities were likewise defeated.

This was followed on November 7 in Cincinnati, Ohio, which is considered to be in the ultimate Muscle Shoals territory, by the rejection on the part of the voters of a proposal to acquire the gas and electric facilities of the private utility serving the city. Opposition to the measure was quite general, since the financial and legal aspects were considered indefinite and unsatisfactory.

On November 25 Knoxville, Tenn., by a two-to-one vote approved the issuance of $3,225,000 bonds for a municipal electric distributing system. Knoxville had already applied to the Tennessee Valley Authority for Muscle Shoals power, and became the first large city to authorize the necessary funds. The private utility is expected to make heavy cuts in rates in competition with the city's system.

On November 7 two cities of somewhat larger size than Knoxville approved municipal ownership projects. One of them was Camden, N. J., which voted to spend not more than $10,000,000 for an electric plant. If this project is carried through, it will constitute the most drastic municipal opposition to the powerful Public Service Corporation of New Jersey, although a municipal ownership proposition is also being urged in the city of Newark, N. J.

The other city was Akron, Ohio, which decided by a small majority to purchase or build an electric generating plant and distribution system. Sandusky, Ohio, also approved a proposal for a $1,400,000 municipal power plant. Columbus, Ohio, which already has a municipal plant serving a small part of the city, approved a bond issue for extensions to the plant. Fleetwood, Pa., authorized electric generating plant bonds to the amount of $110,000. Shelbyville, Ky., voted $125,000 for a municipal lighting plant.

San Francisco voters approved both a $12,095,000 bond issue for water distribution purposes, and $3,500,000 for the Hetch Hetchy dam, but turned down the proposition for $6,308,000 for a municipal electric distribution system.

November 7 brought certain other reverses as to municipal ownership proposals. Salt Lake City, Utah, defeated a proposal that the city issue $18,000,000 in bonds to build a municipal power plant. In Youngstown, Ohio, a $500,000 bond issue for municipal electric distribution purposes was rejected. Portsmouth, Ohio, turned down a municipal power-plant proposal, and the small cities of Bordentown and Burlington, New Jersey, and Tyrone, Pa., also voted adversely on municipal ownership matters. The city of Bethlehem, Pa., had expected to vote on a bond issue for a municipal electric plant for street-lighting purposes, but was prevented from doing so by a court injunction.

In Detroit, Mich., approval for a subway construction proposal which provides for the construction and operation of a rapid transit system was voted. The estimated cost, $87,854,000, is expected to be met by a Federal loan and 30 per cent grant.

A number of water-works proposals, in addition to the San Francisco measures, were approved at the November election, including bond issues of $1,850,000 in Reading, Pa., $100,000 in Pemberville, Ohio, $165,000 in Upper Sandusky, Ohio, $50,000 in Baltimore, Ohio, $18,000 in Sandy Lake, Pa., and $15,500 in Lucas, Ohio.

H. M. OLMSTED.

Traffic Safety Contest Announced for 1934

THE National Safety Council, in announcing the third annual National Traffic Safety Contest, calls attention to the fact that invitations to enroll in the contest are extended with the knowledge that active participation in it will actually reduce accidents. The announcement says in part:

"In the 1932 Contest (the first) the cities making final reports scored a 16 per cent reduction in deaths, which is to be compared with a 9 per cent reduction in all cities reporting to the United States Census Bureau. The 70 cities receiving awards averaged a 23 per cent reduction in that year. The cities which received the highest scores for safety activities made the greatest reductions in accidents.

"Thus, the National Safety Council this year can do more than ask you to enroll your city on the theory that such an action 'might' or 'probably would' do some good. We can assure you that active participation in the Contest will without doubt help to reduce accidents on the streets of your community.

The terms of the coming Contest will be the same as before, except for two changes. Cities between 5,000 and 10,000 (1930 Census figures) which do not have a fatal accident during 1934 will be listed on a special honor roll and will receive certificates commending them for this accomplishment.

There is one change in the grading schedule. Item G relating to community safety organization has been dropped for the reason that the city with such an organization gets credit for its activities in other sections of the grading schedule. A perfect score in the 1934 Contest will thus be 100, rather than 110 as heretofore.

The terms of the Contest recognize two kinds of safety accomplishments: first, a low death rate from motor-vehicle accidents, and a lowering of the death rate from previous years; second, the enactment of regulations, the setting-up of administrative machinery, and the conduct of educational activities.

Grading Schedule

For small cities, some of the items under Traffic Planning and Traffic Law Enforcement are modified or omitted.

A. Accident Record—50 points

1. Motor-vehicle death rate per 100,000 population, for the year, including only deaths from accidents within city limits.
2. Reduction in such death rate compared with average of three years preceding.

B. Accident Reporting—5 points

Use of Standard Traffic Accident Reporting System or equivalent.

C. Traffic Planning—10 points

Traffic studies; street improvements; conformance with recognized standards for traffic signals and signs; traffic planning set-up.

D. Traffic Law Enforcement—15 points

Conformance with Model Municipal Traffic Ordinance; proper organization and training of traffic forces; accident investigation; enforcement directed at those violations that cause accidents; report number of arrests and summonses and number of convictions.

E. Child Safety—10 points

Safety instruction in elementary schools, including junior safety councils and patrols; safety instruction in high schools, including student drivers' schools or motor traffic clubs; safety activities on summer playgrounds and beaches.

F. Public Education—10 points

Newspaper publicity; radio traffic safety program; street safety posters; safety meetings; special campaigns; commercial driver activities.

Perfect score, 100 points

Inquiries regarding the contest should be addressed to the National Safety Council, 20 North Wacker Drive, Chicago, Ill.

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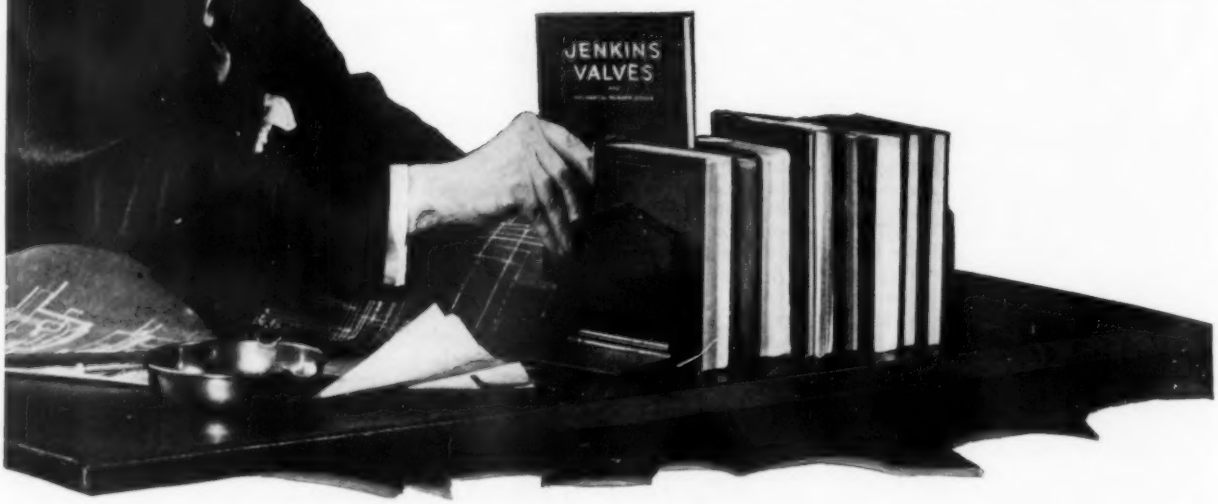

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•

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One of the features which keeps this new Catalog within easy reach of men who must deal with valves is the large Engineering Data Section. This part of the book actually is a well arranged, practical encyclopedia of information constantly needed.

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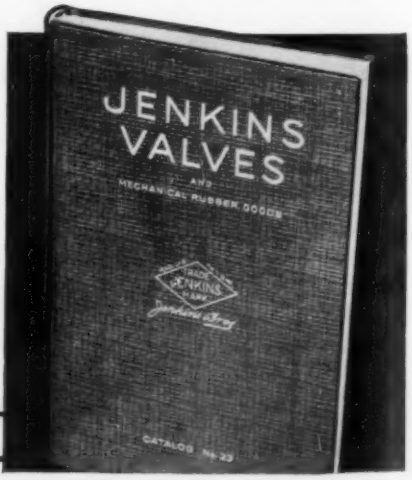

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DECEMBER, 1933

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The American City

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The Disposal of Sewage Sludge by Incineration

A Method Which Will Mean Great Savings of Real Estate Investment by Municipalities

By THEODORE REED KENDALL
Engineering Editor, The American City

THE great areas devoted to sludge drying beds in sewage treatment plants built one or two decades ago have in recent years been somewhat reduced by the use of glass covers, which increase the number of loadings on an individual bed per year because rain is eliminated. Today there is a definite trend toward the incineration of sewage sludge to reduce the present area of drying beds and to do away with sludge dumps.

Incineration is not a cure-all, because it immediately raises a number of new problems. The sludge must be processed and dried before incineration, and there must be a fairly large investment in machinery for this work. Unless proper steps are taken to carefully control the vapors from dryers, serious nuisance is likely to occur, producing complaints and even injunctions from neighboring residential areas.

The resulting clinker from the incineration of sewage sludge is innocuous, crushes fairly readily, is porous and can be used for fill. It does not make a good road material, but there is a possibility that impregnation of the clinker with asphalt may sufficiently bond and strengthen the clinker so that its use as an aggregate in secondary roads will be possible. Certain mechanical and combustion engineers have hopes that the burning of processed sludge as a fuel may make it possible to produce part of the power necessary for the operation of modern sewage treatment plants.

Cities which may be considering the immediate erection of incinerators for sewage sludge are cautioned to proceed slowly. A great deal of experimental work with excellent results has been done by the Sanitary District of Chicago at its sludge incineration plant located at the West Side sewage treatment works. A brief description of this plant has been prepared in order that sewage works officials may know the extent to which studies of this problem have been carried.

Types of Sludge Used

The Sanitary District experimental plant has used straight activated sludge with additions of various quantities of fresh settling tank solids, and also straight Imhoff tank sludge. The activated sludge available for these experiments is about fifteen hours old as it is received from the North Side sewage treatment plant. Excellent results have been secured with about 15 per cent of the raw settling tank solids as far as the filtering of the sludge prior to drying is concerned. Some of the North Side activated sludge is digested with the raw solids in an Imhoff tank, giving a resulting sludge of from 92 to 94 per cent moisture, which results in a cake ranging from 76 to 79 per cent moisture, produced by the Oliver sludge filter. A sludge cake of straight activated sludge contains 83 to 85 per cent moisture, and a cake of fresh solids from 80 to 81 per cent moisture.

Conditioning the Sludge

Prior to filtering, all sludge is conditioned with 4 to 6 per cent of ferric chloride, proportioned by dry weight of solids. The Imhoff sludge requires more ferric chloride and produces a higher yield from the filter but with more iron in the filtrate. The ferric chloride is delivered to the experimental plant in a rubber-lined tank car, from which it flows to a storage tank. The sludge is pumped from the various tanks through a rotary crusher to a concentration tank, where a revolving thickener mechanism gives it the uniform density necessary for satisfactory filtration. The pumping is done by a plunger type pump with the ferric chloride pump operating from the same shaft with a variable stroke; thus a uniform rate of application of the chemical is maintained for any speed of sludge pumping. The sludge pump speed is controlled by a float in the filter reservoir through a Reeves variable drive. The

mixture of ferric chloride and sludge is effected in a rubber-lined tank 11 feet high x 5 feet in diameter, near the base of which a pipe grid admits air to agitate the contents and produce a uniform mixture.

Filtering the Sludge

An Oliver filter 11 feet 6 inches in diameter and 15 feet long, with 575 square feet of filter surface, is used for filtering the processed sludge. The filter is covered with a wool sewage cloth with a long nap. The cloth is held close to the filter drum with chrome alloy wires running around the circumference of the drum and spaced 2½ inches on centers. There are 24 vacuum sections in the drum, which are operated successively by ports in the supporting shaft. From 25 to 27 inches of vacuum is used both for picking up the sludge from the sludge reservoir and for drying it. The sludge is removed by a positive blow of about 7 pounds pressure which loosens the cake and permits the scrapers to pick it off. The cake varies from ⅛- to ¼-inch thick, depending on the moisture content of the sludge, the vacuum and the speed of the filter. The dried sludge cake is dropped onto a lateral belt conveyor which delivers it through a hopper to a lifting belt conveyor, which passes over a Sintering Machinery Corporation Transporto meter giving a continuous record of the total weight of filtered sludge delivered to the dryer.

The Rotary Kiln Dryer

The sludge cake at the end of the lifting belt conveyor is taken by a screw conveyor and delivered to a rotary kiln dryer 70 feet long by 8 feet internal diameter. Thirty feet of the dryer is encased in a brick furnace lined with firebrick. The outer shell of the dryer is equipped with a large number of lifting angles on the inner surface which cascade the drying sludge as it moves slowly from the inlet to the discharge end of the dryer. The average time that the sludge is in the dryer is 1¼ hours. For experimental purposes the dryer is equipped with a variable speed drive. An inner hot gas flue runs the entire length of the dryer and is concentric with the outer shell. The hot gases from the furnace enter this flue through an entrance flue which pierces the outer shell and connects directly with the hot gas flue. There are three sets of ports from the hot gas flue into the dryer, so that a predetermined portion of the hot gas is applied near the entrance end of the dryer where the sludge is wettest. The gas discharged from the second and third ports passes back to the entrance end, where the hot gases, plus the obnoxious vapors from the dried sludge are removed by an induced draft. The amount of hot gas delivered to the discharge end of the dryer is controlled by an adjustable damper which can be entirely closed if desired. The sludge cake is always in motion between the outer shell and the hot gas flue.

There are two stacks at the exhaust end of the dryer, one of which is connected to the exhaust fan and obnoxious vapor condenser, and the other a relief stack opening direct to the outer air for use in case the heat within the dryer becomes too great and the sludge volatilizes too rapidly.

The obnoxious vapor condenser is of venturi-tube type, with the tube placed vertically and a jet of water delivered through the tube in the same direction. The gases then go through a concrete scrubber box, where there are a series of concrete baffles with ball-mouth openings and a water jet directed toward and through each opening in the direction of the flow of the gas. The final moisture-laden gases go to the open air through a tall steel stack. Imhoff tank effluent is used for both condensing and washing the gases.

Burning the Sludge

The sludge from the delivery end of the dryer has from 15 to 20 per cent moisture and is delivered to a transverse belt and thence to a hopper feeding to a long inclined belt conveyor which delivers the dried cake to the stoker through a chute. Provision is also made for returning any portion of the sludge to the dryer, if necessary. This feature, however, has not been used, for the cake has been satisfactorily dried at all times. The dried sludge chute drops the material onto a sloping baffle plate which forms a hopper over the oscillating feeder plate of a Whiting-Harrington step grate stoker. The forced draft for the burning of the sludge is taken from within the building in an endeavor to confine any odors which may exist within the structure. There is individual control of the draft for each step of the grate. The gases of combustion go over a bridge wall and then under a checkered arch and up through the entrance flue to the hot gas flue within the dryer. A separate chute over the stoker delivers whatever coal may be necessary to give satisfactory combustion.

Sludge as a Fuel

The sludge as burned in the incinerator at Chicago is from 55 to 75 per cent volatile and has a B.T.U. value of between 5,000 and 7,500, which is about one-half that of standard Illinois soft coal. The furnace temperature is estimated at between 1800° and 2000° F.; the temperature of the gases of combustion entering below the checkered arch is recorded on a Brown pyrometer and runs between 900° and 1400° F.; the stack temperature runs between 200° and 230° F.

Effective Size of Experimental Plant

The experimental sludge incineration plant at the West Side sewage treatment works of the Sanitary District of Chicago is housed in a three-story building measuring 110 x 75 feet in plan. The capacity of the dryer is about 20 dry tons of sludge per day, which, on the basis of 1,000 pounds of dry sludge per million gallons of sewage, means that this plant could take care of the conditioning, filtering, drying and final disposal by incineration of the sludge from a community producing 40,000,000 gallons of sewage daily, or about 400,000 people.

The experimental plant has been developed by William A. Dundas, Mechanical Engineer, and the engineering staff of the Sanitary District of Chicago under the direction of Philip Harrington, Chief Engineer. Operation is in charge of A. H. Goodman, Engineer of Plant Operation, West Side sewage treatment works.

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The New Zeolite Softening Plant at Lancaster, Ohio

Plant Built for Future Expansion Is Now the Largest of Its Type in the State

LOCATED within a 22-acre park, the water-works plant of the city of Lancaster, Ohio, has a particularly delightful setting which has been used to advantage by building an attractive new building to house the softening plant. Baseball diamonds, football fields, tennis courts and large grassy areas extend to the north and west of the plant and the two deep wells. All sewers within 1,000 feet of the plant are of cast iron pipe with lead joints to insure the protection of the wells from possible pollution. The underground basin from which the two Layne-Bowler deep-well pumps draw has not shown any lowering of the water level even during the unprecedented droughts of the last few years. The city and its water works are located within a large plain surrounded by low hills which has formed a natural underground basin of a moderately hard water.

The water is drawn from the wells by two 24-inch pumps through 60 feet of 12-inch screen and 60 feet of steel well casing, the suction of the pumps being about 30 feet. The pumps are automatically controlled by the level of the water in the retention basin of the plant. The capacity of the pumps is 900 gpm each. The water is delivered direct to the Aer-O-Mix unit in the retention basin, which thoroughly aerates the water and oxidizes the iron in the ground water so that it may be filtered out in the plant. Practically no iron settles out in the retention basin, through which the water passes in about 30 minutes. About one ton of coke was placed on the roof of the basin on the side of the baffle wall away from the aerator and immediately around the outlet pipe to check the whirling of the water as it enters the pipe. This effluent pipe from the retention basin is 18 inches in diameter and leads into the pipe gallery of the softening building. A revelation to the older school of filter operators and builders, the pipe gallery is spacious, naturally lighted, and well drained, and every part is easy of access. All pipe were painted with aluminum paint as soon as installed and then given a coat of light gray enamel. The entire lower floor of the plant, which includes the pipe gallery and pump room, is painted an egg-shell white on walls and ceiling, and a light tan on the base extending about 4 feet up the walls. The drains for the pipe gallery are quite necessary in summer in spite of tight connections at all joints. The ground-water temperature is 53 degrees the year round, and during the summer there is considerable condensation of atmospheric moisture.

The plant was designed so that it would be well balanced throughout as far as operating conditions are concerned. There are two pumps delivering about 1,300,000 gallons of water at full capacity. Each of the filters and each of the softeners has a daily capacity for one million gallons of water delivered to the mains. Thus the filters have a slightly larger capacity, for they have to produce the filtered water used for washing the filters and the softeners as well as for making up the brine solution for regenerating the softeners.

The installation has space for three filters, two of which are equipped at present. They measure 15 x 18 feet and have a capacity of 900 gallons per minute each. They are equipped with International rate of flow controllers, loss of head gages, operating tables and hydraulically operated valves. The water from the retention basin flows by gravity to the filters and then to the transfer pumps, two Worthington centrifugals of 750 and 1,500 gallons per minute capacity. The filters are built up with five sizes of gravel to a total depth of 14 inches with 27 inches of sand. The underdrain system is the Wagner block system.

Washing of the filters is by the conventional upward

GENERAL VIEW OF THE LANCASTER WATER - SOFTENING PLANT

The elevated wash-water tank at the left and one of the two deep wells in the right foreground

flow of water, but filtered unsoftened water is used for this purpose. Water for washing is pumped by a Worthington 250-gpm centrifugal automatically started and stopped by an Electric Controller & Mfg. Co. altitude gage. The outside elevated wash-water tank was built by the Chicago Bridge & Iron Works and has a capacity of 40,000 gallons. The wash-water pump suction is from the 16-inch filter effluent line, from which the two transfer pumps also pump to the softeners through a proportioning device which permits 80 per cent of the filtered water to go to the softeners and 20 per cent to a mixing tee directly above the clear well. An International venturi on the 12-inch discharge line of the transfer pumps actuates the proportional device through hydraulic valves. At the mixing tee the softened water and the 20 per cent of filtered water are mixed, and immediately flow into the clear well, which has a capacity of 107,525 gallons.

The wash-water troughs of the filters have 27 inches freeboard above the sand. The rate of washing is at 24 inches vertical rise per minute. A Sparling meter installed adjacent to the clear-well gage at the softening end of the building shows the total amount of filtered water pumped to the wash-water tank, so that it is possible at any time to compute the per cent of wash water used in the plant. An average month shows 4 per cent wash water for the filters and 4.28 per cent for washing the softeners. The new type operating tables of the filters and softeners have lever control for the hydraulic valves, with visual indicators to show on the table the exact amount the valves are open and whether fully open or fully closed.

The Softeners

The softeners, of which there are three, with two equipped at present, measure 9 x 11 feet and have a capacity of one million gallons daily each. They are built for upward flow of the water for softening, and downward flow for washing and regenerating. Over the underdrains there is 12 inches of gravel topped with 4½ feet of Crystalite, a synthetic zeolite of much greater porosity than natural zeolite, thus increasing its effectiveness and requiring a smaller quantity for like results. The troughs in which the softened water is collected, and which correspond to the wash-water troughs of the filters, are located with the tops 30 inches above the zeolite when it is at rest. The zeolite, being about the size of coarse sand, is suspended in the water during the softening process.

The end of the softening run is determined chemically. The runs are usually from 7½ to 8 hours, and during the last hour of the run samples of the effluent are taken and tested for hardness, which should be zero, at 15-minute intervals for the first half-hour and every 10 minutes for the last period until the effectiveness of the softening material has ceased. The softener is immediately cut out of service and drained to the sewer. Then the drain is closed, and 1,300 gallons of brine, prepared as described below, is pumped into the unit. The softener is then backfilled through what would be the sewer drain of a regular filter, without disturbing the brine, to about 4 feet above the zeolite with filtered water. The brine, being heavy, is not disturbed by this filling and does not mix appreciably with the water. The brine and wash water are then drained to the sewer at the rate of 2 feet drop in 4 minutes. This is followed by a "slow wash" at the rate of 2 inches per minute flow downward for 23 minutes to the sewer, using filtered water. A "fast wash" follows this for 10 minutes, the flow being at the rate of 8 to 10 inches downward flow per minute. The effluent is then tested for chlorides, and the wash is continued further if the chlorides show more than 150 ppm.

Service Pumps

Water from the clear well, which contains the 80 per cent water of zero hardness and the 20 per cent water which has only been filtered to remove the iron, is pumped into the distribution system by two DeLaval pumps of 1,400 gallons capacity each per minute, operating at 1,750 rpm against a head of 311 feet, or 135 pounds pressure. They are driven direct by General Electric motors. These pumps are used one at a time and are placed alternately in service, the change being made on Saturday nights. They pump through the distribution system to the supply reservoir on a hill about 2 miles from the pumping station. The reservoir measures 100 x 200 x 16.3 feet deep, with sloping sides, and stores 2,310,525 gallons of water when filled. It is brick lined and not covered.

Installed alongside the service pumps are two Ingersoll-Rand Imperial type compound air compressors of 1,450 feet rated capacity each. They are maintained as standby units to operate the set of six old air-lift wells which were used regularly prior to the installation of the Layne-Bowler deep-well pumps. The efficiency of the air-lift installation was 23 per cent, while the new deep-well installation is 66 per cent.

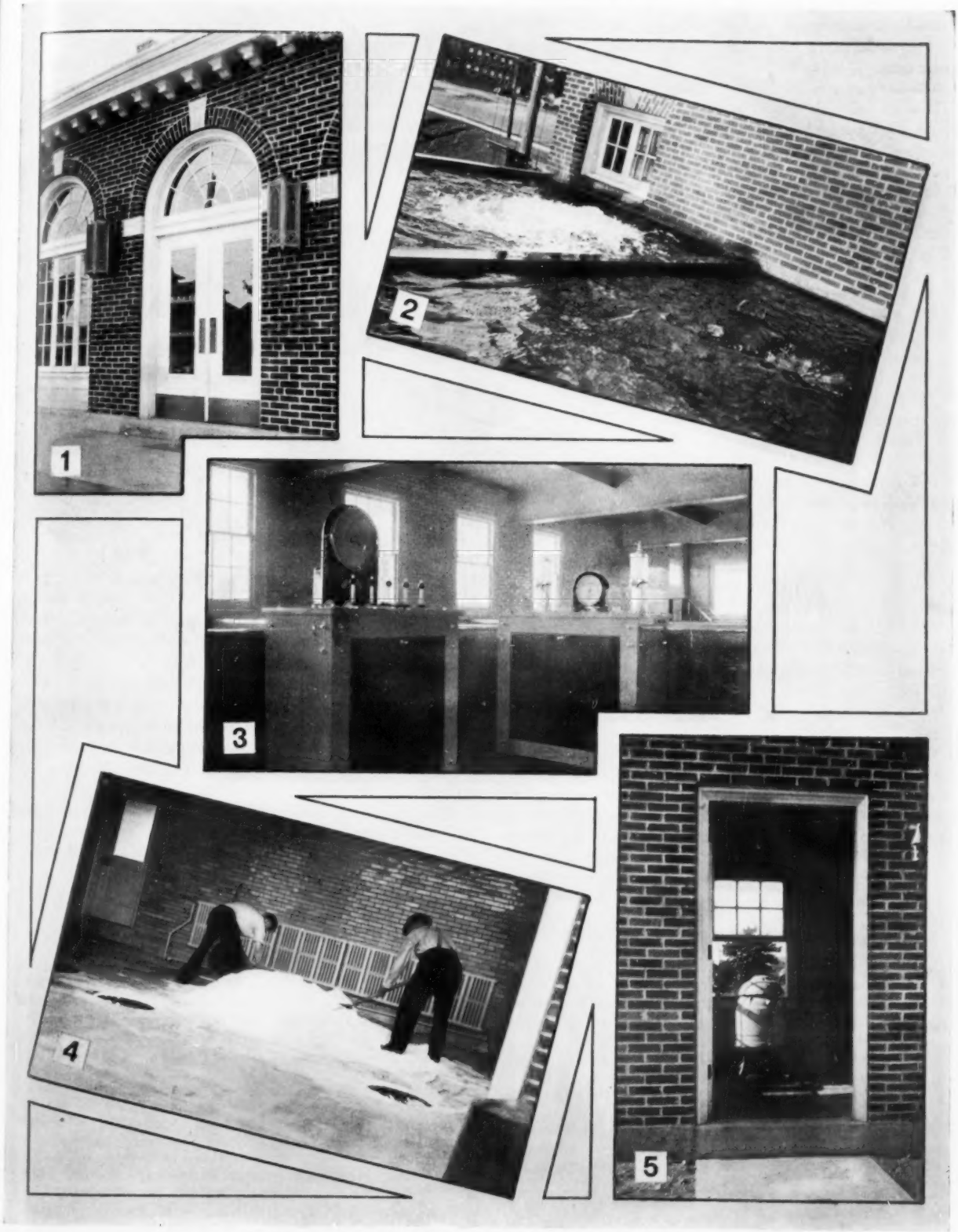
The compressors and the two service pumps were parts of the old plant which has been superseded by the new installation. When the change was being made, the old building was torn down while the pumps and compressors were closely housed in a temporary structure. Then the new building was built around them and they are in exactly the same location as when housed by the old building. Good design and operation made the cut-overs possible without shutting down the plant except for the very short period of actual installation of the last connections, and during that time the reservoir carried the load alone.

The entire plant with the exception of the old equipment mentioned above is controlled by open type button switches made by the Electric Controller & Mfg. Co. The older equipment has General Electric starting switches.

Preparing and Handling the Brine

Common salt for the brine used to regenerate the softeners is purchased under contract from the Ohio Salt Co., Wadsworth, Ohio, which delivers it in carload lots to a siding in Lancaster. It is unloaded by hand from the box cars and hauled by truck to the softening plant, where it is dumped through four manholes into the brine storage tank. For emergency service about one-half carload is stored at the city yard. The brine storage tank holds about 75 tons of salt, or nearly two carloads. The storage tank has a slightly sloped bottom with a drain at the center made of half-round sewer tile laid with open joints. Over this to a depth of 14 inches is a layer of gravel, which extends up to the top of the sloping bottom. No matter how much salt is in the storage tank, the water is maintained about one foot above the salt. The drain in the storage tank leads to the brine-measuring tank.

Saturated brine is allowed to flow to the brine-measur-



SCENES AT THE LANCASTER, OHIO, WATER-SOFTENING PLANT

1. Entrance to the plant. 2. The Aer-O-Mix effluent. 3. At left, the operating table for one of the softeners; and at right, the sampling table. 4. Shoveling salt into the solution tank. 5. One of the Layne-Bowler deep-well pumps

ing tank to a depth of 1 foot 10 inches. The area of the tank is 1 feet by 12 feet 10½ inches. The saturated brine in the brine-measuring tank is then diluted with filtered water to a depth of 3 feet 3 inches, which is the capacity of the tank.

A brine pump with cast iron impellers, so that there will be no galvanic action between the impellers and the casing, is used to pump the regenerating liquid to the softeners. The pump cannot be started until the brine-measuring tank is filled, so that exactly the same amount of brine, carrying the equivalent of 1,700 pounds of dry salt, will be used to regenerate a unit. A hydraulic operating table for the brine at the measuring tank operates the two 2-inch and the one 3-inch valve connected with the handling of the brine from the storage to the measuring tank, its dilution and finally its flow through the pump to the softeners.

The brine pump delivers the brine to the softeners through a 6-inch distributor pipe suspended between the two troughs in the softener. From the distributor pipe are four 3-inch pipes leading to the corners of the softener, with perforations at 15 degrees below the horizontal, to spray the brine over the entire area of the zeolite. The total time for regenerating a bed of zeolite after it has ceased to function is between 1 and 1½ hours. The softeners operate at the rate of 6 gallons per square foot per minute, and the salt required for regeneration is about 0.3-pound per 1,000 grains of hardness removed.

All piping for the hydraulic valves throughout the plant as well as for the loss of head gages and rate of flow gages is Mueller copper tubing. A sampling table at the softeners, equipped with an ejector, permits taking a sample from the softeners, effluent and drain lines at any time for analysis. The sampling pipe valves are hydraulically operated.

Plant Output Metered

Normally the plant operates with two 8-hour shifts per day, but in hot weather it is necessary to operate the full 24 hours. The normal pumpage is about one million gallons daily. A Sparling main-line meter on the discharge main from the plant has an indicator showing the flow in gallons per minute, the total flow, and a recording chart or "Metrograph recorder" actuated by a Telechron electric clock, which indicates each 10,000 gallons of flow by a "scallop" in the reading on the chart.

Cost Data and Analyses

The city pays 1.75 cents per kilowatt-hour for energy used at the plant, with the current metered on the primary side of the transformer. The total head on the well pumps is 59 feet, and the total head on the transfer pumps, or the loss of head through the softeners, is 22 feet. As stated before, the service pumps operate against a head of 311 feet.

The cost of electric energy for the entire plant is $36.35 per million gallons, and the cost of salt for regenerating the softeners is $17.08 per million gallons of water, making a total of $53.43 per million gallons for supplying water. The plant cost per 1,000 gallons of water delivered to the mains, including pumping, softening, labor, oil, and electricity, but no overhead or plant depreciation, is $0.06343. The water rate in Lancaster, Ohio, is 20 cents per 100 cubic feet, or 26.67 cents per 1,000 gallons.

AVERAGE ANALYSIS OF MONTHLY COMPOSITE SAMPLES

Sample	Alkalinity	Total Hardness	Iron	Chlorides
Raw water	289	360	2.7	27
Aerated	291	355	2.7	18
Clear well	299	80	0.0	19

In order that the plant may not be crippled in case of the inability of the city to secure salt at any time to regenerate the softeners, provision is made to by-pass the softeners.

The population of Lancaster, Ohio, is 19,000, and it now has the largest zeolite softening plant in the state of Ohio. The plant cost $75,000. The distribution system includes 40 miles of cast iron pipe from 3 to 16 inches in diameter. The average pressure throughout the city is 115 pounds per square inch. It is interesting to note that this city has its own natural gas wells, and uses gas for heating the softening plant in an automatic steam boiler. There is also a gas heating boiler for hot water for the lavatories at the plant.

This plant was designed by C. P. Hoover, consulting engineer, Columbus, Ohio, and was built by contract under the supervision of the City Engineer, Walter W. Graf, who is also responsible for its operation.

Evils of Competitive Bidding for Municipal Audits

THE appointment of a special committee of seven to engage in a study of municipal finance and accounting problems in cooperation with committees of other national organizations was announced November 19 by the American Institute of Accountants.

The Institute's action followed recommendations of the conference on municipal accounting called recently in Chicago by the Public Administration Clearing House.* Each of these organizations is to be represented on a central committee which will work with a full-time staff of the Municipal Finance Officers' Association. Lloyd Morey, Comptroller of the University of Illinois, represents the Institute on this central committee and has been made chairman of the special committee to report on the research to the Institute. The Institute's committee will undertake other studies in the general field of governmental accounting.

"Perhaps no branch of our work is attracting more attention than is municipal accounting and in no branch do the views of the leading practitioners diverge so widely," says Walter Mucklow, of Jacksonville, just appointed to the Institute's committee. Speaking of the practice of competitive bidding by accountants for municipal and other governmental audits, Mr. Mucklow states that the evils of this custom are increased by the fact that there is little uniformity in the minds of many competing auditors as to the scope of the work to be undertaken.

"While one man contemplates a thorough audit and bids accordingly," he says, "another has it in mind to 'get by' merely by going through the motions of an audit. The average public official, being untrained in such matters, and having no conception of the difference in purpose of the two accountants, selects, not unnaturally, perhaps the one whose bid is the lower. This condition would be largely obviated and one of the most unfortunate features of the system partly overcome, if the bids were based on specifications, furnished by the municipality in advance of the bidding, to which the auditor chosen would be strictly held. It is one purpose of the present study to promote standardization of such specifications."

C. C. SMITH.

* See THE AMERICAN CITY for November, 1933, page 77.

Heavy Rock Excavation and Paving as a Work Relief Project

New Western Entrance to the City of Port Jervis, N. Y., Has Aided Hundreds of Its Citizens

AN $80,000 bond issue was voted by the citizens of Port Jervis on November 19, 1932, by the overwhelming ratio of 4 to 1, for the construction of a new ½-mile highway at the northern entrance to the city. This work on Park Avenue involved about 12,000 yards of earth excavation and 35,000 yards of rock excavation, all of which was done by hand. Between 600 and 700 able-bodied men were employed through the Work Relief Bureau of Port Jervis from December, 1932, to August, 1933. One hundred men went to work each Monday morning and were replaced on Thursday by a second shift of 100 men, who worked until the close of the week. Work was held up less than ten days during the winter of 1932-33 by rain or cold weather.

Preliminary work was started the day before Christmas, 1932, only a few days after the sale of bonds authorized at the special election. First, a drainage system was installed in Mount William Street near the south end of the project, and then the first crew was put to work cutting down half a mile of trees and brush, before the heavy excavation began.

The Excavation

Excavation was started at both ends of the road and involved considerable heavy drilling, which was done with jackhammers, the only mechanical equipment outside of motor trucks used on the job. At the center of the 2,768 feet of excavation there was considerable fill. In order to handle the excavated material from convenient points and to use as many hand laborers as possible, eight Ford motor trucks were hauled up the rough slope of the hill by tractors to handle the excavated material.

There were two major ledges which had to be drilled, blasted and excavated, one of shale and the other of trap rock. The maximum rock cut was 50 feet deep in side-hill excavation. The heavy rock excavation required about one carload of dynamite for blasting.

The rock excavated from Park Avenue and not needed for the fill at the center of the job was used to widen Grandview Avenue below. Great care had to be taken in the blasting operations because of the steep slope from the new road to Grandview Avenue.

Paving

Upon the completion of the excavation, in August, 1933, a contract for slightly more than $23,000 was awarded to Harold H. Smith, Inc., of Middletown, N. Y., to pave this new roadway with an 8-inch reinforced concrete slab 30 feet wide and with a 7-foot concrete sidewalk on the outside and a gutter on the inside of the pavement. The contractor furnished all materials and supervision, and the labor was done by unemployed men furnished through the Work Relief Bureau of Port Jervis. The work on this pavement was completed about the middle of October and

HAND OPERATIONS AFTER A BLAST AT ONE OF THE DEEP ROCK CUTS

See front cover for photograph of completed highway

the project was open for traffic on Hallowe'en.

Other features of the undertaking included an observation platform for a lookout near the center of the work, which gives a view of practically the whole of Port Jervis and across the Delaware to the state of Pennsylvania, and as far as High Point, N. J., where that state has erected a World War Memorial Tower. Also, as described in this issue of THE AMERICAN CITY this section of highway, which stands out boldly above the city of Port Jervis, is lighted with sodium vapor lights.

The entire project, covering grading, paving, lighting and the lookout, will cost approximately $130,000 including the refund given by the State Temporary Emergency Relief Administration. This is one of several work relief projects instituted by Wendell E. Phillips, Mayor, and carried out under the direction of Frederick X. Conrad, City Engineer, and George H. Bierlein, Superintendent of Streets.

Fighting the Ice Hazard on Streets and Highways

By **B. C. TINEY**
Former Maintenance Engineer, Michigan State Highway Department

EVERY highway superintendent and maintenance engineer shoulders an added traffic safety responsibility at this time of the year. Many serious and fatal accidents, as well as great damage to motor vehicles, are traceable every winter to dangerous road conditions, created by ice and snow. The elimination of such conditions, when they arise, is the duty of those public officials who have supervision over our highways.

Probably no phase of highway maintenance work is more appreciated by the motoring public than the effective treatment of icy pavements for reduction of slipperiness. Much thought has been given to this problem in recent years by highway officials and others, looking to the development of materials, equipment, and methods for reducing the hazard of winter highway transportation. The complete removal of ice from road surfaces is not generally practicable. The most approved method of treatment is to create a non-skid surface by embedding an abrasive material in the ice until such time as a thaw softens the ice and permits ready removal with graders.

The abrasive used may be coarse sand, fine gravel, crushed stone, slag or cinders. Although not generally available, cinders have been found to embed more readily because of their angular shape, and their black color appears to absorb the sun's heat and cause a slight thawing of the ice. When abrasive materials are applied to an icy road surface, they are apt to be removed within a short time by winds and the suction of pneumatic tires, unless some means is used to embed them quickly. This may be accomplished by adding calcium chloride in sufficient quantity to cause a slight thawing of the ice surface. The use of this thawing agent reduces the number of sanding operations necessary, by making each operation quickly effectve and more lasting.

Since icy conditions often develop suddenly over a large mileage of roads, it is necessary for the maintenance superintendent to be prepared in advance to meet the situation. The usual practice is to stock-pile sand or other abrasives in the fall of the year near the sections of road to be treated. From 25 to 50 pounds of calcium chloride per cubic yard of sand, spread over the stock-pile, will dissolve and prevent serious freezing of the sand. At the time of applying the sand to the road, the addition of flake calcium chloride to the sand at the rate of 50 pounds per cubic yard will embed the sand quickly in the ice.

Preventing Damage to the Surface

Some question has arisen in certain instances as to the scaling of cement-concrete surfaces by the use of calcium chloride in the treatment of ice. This question has been given a great deal of study by highway experts. On pavements where scaling attributed to this cause has occurred, it is believed that generally larger quantities of calcium chloride than those above mentioned were used, and that the action resulted from alternate freezing and thawing of the surface due to the absorption of the solution.

This was in some cases aggravated by the grinding action, under traffic, of the abrasive left on the pavement after the ice had melted. In many locations, treatments have been applied without any indication of scaling. If the use of calcium chloride is confined to the above quantities, and any excess abrasive is removed after the ice has melted, the probability of damage to cement-concrete surfaces is negligible.

Treat Worst Hazards First

First attention in the treatment of highway ice conditions naturally has been given to the hills, curves, and approaches to railroad crossings and highway intersections. However, since accidents due to ice have happened on other portions of roads, many superintendents are giving serious thought to arrangements for sanding the full length of important highways. One county in Michigan has established storage bins at convenient locations and is equipped to treat the full length of two important roads across the county within a few hours. Mechanical spreaders are preferable to hand work because of their more uniform and rapid distribution.

An ice storm should have the same relation to a maintenance superintendent as a fire to a fire chief. It calls for rapid, well-planned action in order to protect life and property.

Fort Wayne, Indiana, Completes New Filtration Plant and Pumping Station

By **R. L. McNAMEE**
Hoad, Decker, Shoecraft and Drury, Consulting Engineers, Ann Arbor, Mich.

PROFITING much by the present low costs of construction and by the employment of many of its citizens who would otherwise be out of work, the city of Fort Wayne, Ind., is prosecuting a large program of water-works improvements embracing a total expenditure of approximately $2,500,000. The project was initiated in the late months of 1930 following a period of several years in which the city had been embarrassed in the warm months of the year by a shortage of water from its well supply. Exhaustive surveys failed to disclose any large sources of well water which would justify development for a city of over 100,000 population. An appraisal of all available sources of water supply finally led to the development of the city's enlarged supply from the St. Joseph River, a stream which joins with the St. Marys at the heart of Fort Wayne and forms the Maumee.

ENTRANCE LOBBY OF THE NEW PLANT, WITH DISPLAY WELL IN THE FOREGROUND

The Complete Project

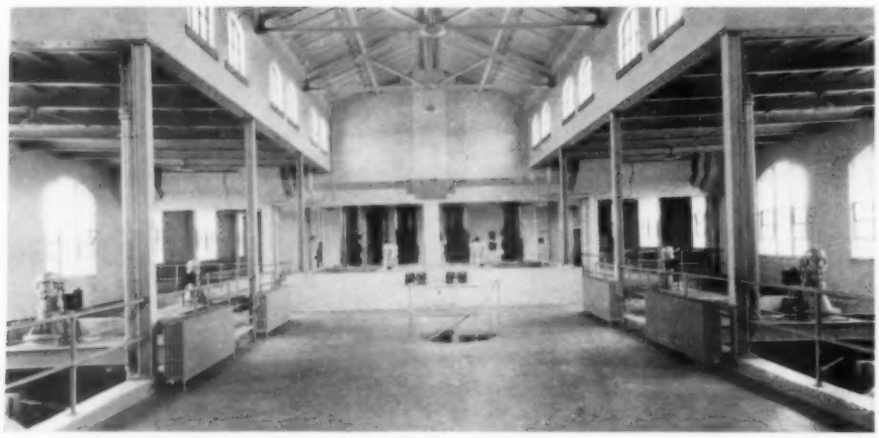
The complete water-works project includes two impounding dams built upon the St. Joseph River, the uppermost, the Robison Park dam, situated about six miles above the city, to impound 700 million gallons of water, and below it the St. Joseph River dam and pumping station, situated just north of the city limits, to impound about 200 million gallons. The lower dam includes a low-service pumping station for delivering the water from the lower pond into a 42-inch raw-water supply main leading down to the downtown softening and filtration plant and high-service pumping station. The downtown station is situated at the junction of the rivers, from which fact it takes its name, the Three Rivers filtration and pumping station. The project also includes several large feeder mains which will radiate from the Three Rivers station out into the city, reinforcing the present distribution system.

The Robison Park dam is not yet under construction, because of delays related to the acquisition of land. The construction work is well along on the St. Joseph River dam and pumping station, and this project should be completed during the next few weeks. Work is now completed upon the 2-mile, 42-inch raw-water supply main of Toncan steel.

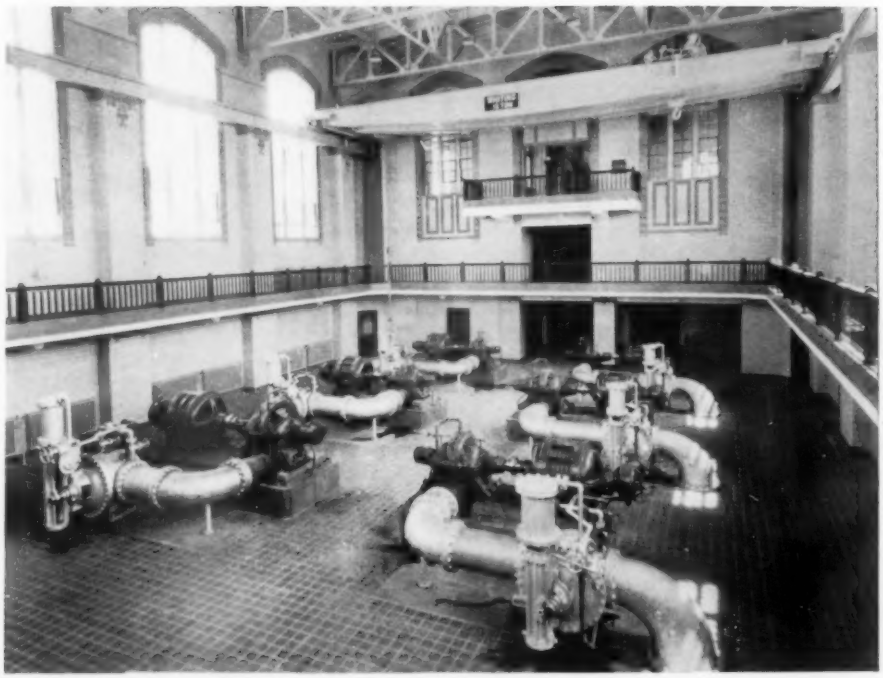
The Three Rivers Plant

Work upon the Three Rivers filtration and pumping station has been under way for over two years. The first unit built was a two-compartment filtered water reservoir having a holding capacity of nearly 20 million gallons of water. This reservoir has rendered good service to the city since its construction as a storage basin for well water from which a supply of the well stations has been supplemented at times when the demand has exceeded the available ground-water supply. The filtration and pumping station proper provides for all the purification processes necessary for the treatment of the river water as well as the pumping of the finished product to the city. The raw St. Joseph River water is received from the St. Joseph River low-service pumping station and is first passed through an aeration basin equipped with Sacramento-type nozzles. The aeration process may be by-passed if desired. The water than passes through mixing tanks where the chemicals are added, through coagulation tanks where an adequate time for the interaction of the chemicals with the water is allowed, through clarifiers of the circular Dorr type, through carbonation tanks, settling tanks and filters to the filtered water reservoir.

Chemicals are received in the plant in trucks or railroad cars and are unloaded and stored in storage bins and handled from these bins to feeding machine service tanks by a pneumatic handling system operating under vacuum. Lime to be applied to the water will be fed as quicklime and continuously slaked and fed into the water as milk of lime solution. The mixing tanks are equipped with rapidly revolving vertical shaft paddle mechanisms for thoroughly mixing the chemicals with the stream of raw water. The coagulation tanks, consisting of two parallel batteries, each battery consisting of three tanks in series, are similarly equipped, except that the paddle mechanisms revolve much more slowly, at rates designed to build up and maintain a satisfactory settling floc.



THE SOFTENING BUILDING, SHOWING THE COAGULATION AND CHEMICAL FEED ROOMS



THE PUMP ROOM OF THE NEW PLANT AT FORT WAYNE, IND.

THE FILTER CONTROL GALLERY

The clarifiers and carbonation basins are likewise in parallel, but all these units are so interconnected by piping that they may be operated either in parallel or in any reasonable order in series. The carbon dioxide gas for carbonation is to be supplied from a coke-fired producer generator, the gas then being burned beneath the steam boiler, and the stack gases from this process scrubbed, dried, compressed and delivered to the carbonation tanks. The heat extracted from this process by the steam boiler is used for heating the plant structures.

The detention periods in these series of tanks are approximately as follows:

Mixing tanks	2 minutes
Coagulation tanks	45 minutes
Clarifiers	1½ hours
Carbonation tanks	15 minutes
Settling tanks	4 hours

From the settling tanks the water will flow to the rapid sand filters, consisting of ten units, each having a capacity of 2.4 million gallons per day. The filter underdrainage system consists of brass bushed cast iron pipe laterals, above which are a bed of gravel 18 inches thick and a bed of filter sand 30 inches thick. Filters are equipped with modern rate-controlling devices, hydraulically operated valves and indicating and recording meters. From the filter the water flows to the underground reinforced concrete filtered water reservoir.

The site of the Three Rivers filtration and pumping station, at the junction of the St. Joseph and St. Mary's Rivers, was an alluvial deposit from which in years past much gravel had been taken for construction purposes. More recently, the pits which had been left have been filled with city refuse of all kinds, principally household rubbish and junk, automobile bodies and factory scrap, making a most unattractive area for a site so prominently situated. The building on such a site of a large structure such as a water-works plant, especially one in which settlement cannot be countenanced, presented serious foundation problems. The design as finally developed and built provided for the support of every structure upon reinforced concrete piles, each designed for a bearing load of 30 tons and an up-lift load of 15 tons. Under certain conditions of high river stages and low water in basins, an actual up-lift may be imposed upon low-lying basins so that each structure is thoroughly tied to the pile foundation system below it. During construction, piles were actually tested to bearing and up-lift loads materially in excess of their designed values.

Advantage is taken of the location and type of aeration spray system used to provide a surge relief for the long raw-water supply main. The raw-water supply main is always in direct connection with the aeration basin, and in the event of a surge or unrelieved pressure in this line, the aeration system will provide such relief. Normally the gradient in the line is just below the spray system nozzles, and the water does not issue from them unless this head is raised by the operation of valves.

By reason of the necessity for building the entire plant upon a foundation of piles, every effort was made to concentrate the several units into as small an area as possible and to load the pile system uniformly to its designed capacity. One result of this plan is the construction of the settling basins as two-story tanks one above the other. The water flows first through the upper basins, which are approximately 15 feet deep, thence over a weir and through a down shaft into a lower story of approximately the same depth, returning at the end of this pass to an outlet having its gradient at approximately the level of the upper tank. By this means the concentration of structures was materially increased and a more uniform piling layout resulted. The aeration system is in reality a third level above the upper settling tanks. The filters are designed for an operating rate of 150 million gallons per acre per day, somewhat higher than has been standard practice. A thorough preliminary treatment which will be given the water before it reaches the filters justifies the higher rate.

Approximately twenty construction contracts have been completed or are now in process of execution. It is the hope of the city administration that the plant may be put into regular continuous service by the end of this month. The present ground-water supply has been in part treated through this plant during the last few months in connection with its tunning-up and preliminary operation.

The whole project has been conceived and carried forward under the administration of the Mayor, William J. Hosey, and the Board of Public Works, John C. Trier, Chairman, David Erwin and Charles R. Ramsey. The entire project has been developed under the engineering plans, specifications and supervision of Hoad, Decker, Shoecraft and Drury, engineers.

HOUSING CONGESTION AND HEALTH CONDITIONS

STATISTICS which appear to show a definite relation between congestion of population and poor health conditions are given in Research Bulletin 3 published October, 1933, by the Committee on Land Utilization of the New York Building Congress. The study is based on an analysis of the U. S. Census statistics of 1930 and data collected by the New York Board of Health. To quote in part:

"Manhattan's population was only 602,054 more than the Bronx (Manhattan 1,867,312, the Bronx, 1,265,258), but Manhattan's density is almost 2¾ times as great. This has a direct bearing on health conditions. The average mortality rate from all causes per thousand of population in the Bronx was 8.4; in Manhattan it was 13.3 (1 3/5 times as great). Separated according to Health Center Districts (as designated by the Board of Health) Mott Haven, the most thickly populated, shows 9.7 per thousand, the highest in the Bronx. Williamsbridge-Westchester shows the lowest rate per thousand, 7.4. In Manhattan the highest mortality rate per thousand is in the lower East Side, 14.0; the lowest, 10.5, is found in Washington Heights. . . .

"In 1930, according to data collected by the Board of Health, an average of 73 infants per thousand of population died in Manhattan. In the Bronx the figure is 44. The highest infant death rate per thousand is not in the lower East Side of Manhattan but in central Harlem, where the figure is 98. The highest in the Bronx is 55 per thousand, and is found in Mott Haven. This area has the lowest median rental, the highest general mortality rate per thousand and showed the smallest intercensal gain of any section of the Bronx."

Doubling Up Accounts for Housing Surplus

A HOUSING survey for Akron, Ohio, has been completed by the Akron Real Estate Board through the aid of the United States Post Office carriers and two Akron newspapers. The survey shows Akron's vacancy in single-family houses to be 3.6 per cent, with a total vacancy in all types of housing units of only 6.6 per cent. The survey showed 1,109 instances where two families are occupying units intended for a single family. Making allowances for these existing families, the single-house vacancy would be approximately absorbed. A considerable number of vacancies were found to be among old houses in such a condition that they should be razed.

Bases, Bedding and Fillers for Brick Pavements

An Abstract of the Report of the Committee on Brick Pavements of the American Road Builders' Association

THE 1933 report of the Committee on Brick Pavements of the American Road Builders' Association briefly reviews some of the matters covered in detail in the last report and discusses some of the newer practices which have been developed more fully in the last year. It also describes some of the results which have been observed on work where recent developments in design have been used and where some of the newer ideas in construction have been carried out.

Bases

Bases may be considered from the standpoint of entire new construction, or of old pavements of various types being salvaged as base courses, or a combination of the two resulting from the widening of old pavements involving replacement of certain sections of questionable value and the improvement of alignment and grade.

In general, concrete is the material ordinarily used in new base construction. This is particularly true in the North, where climatic conditions require construction of a more durable nature than is necessary in the parts of the country where weather conditions are not so severe. Rolled bases of stone or macadam and various other materials which form a semi-rigid base with some degree of flexibility are being used under favorable conditions. The trend in concrete bases is toward weaker mixes and increased thickness.

In 1932 the subject of joint construction in concrete bases was discussed. In general, the design is similar to that used in many concrete pavements, dividing the width into 10-foot lanes with longitudinal joints and transverse contraction joints, spaced at an average interval of 40 feet. Open expansion joints of 1 inch width at about 120-foot intervals, or a 2-inch width at about 240-foot intervals, are used in many cases. The best success seems to have been obtained with a weakened plane type of contraction joint and the open expansion joint. The contraction joint should be filled with bituminous material and covered with a strip of burlap sealed in place, and the expansion joint sealed at the bottom with bituminous material and covered with a metal plate held securely in place. Observations made on bases constructed in this manner in general show very successful results.

All the transverse joints, both contraction and expansion, show evidence of opening up during cold weather. The opening of the joints in the brick surface should be sealed so as to exclude water. In a few cases it has been reported that the plate over the expansion joint has given some trouble and the brick over them were displaced, but no difficulty of this kind has yet been reported with the contraction joints. It is important that the ends of the slab at the expansion joints be carefully finished so that the plate will fit tight to the surface; care must also be taken in placing the plate so that there will be little chance for any of the cushion material to shift under the edges and cause the plate to be displaced. There has been no evidence, either observed or reported, of additional cracking of a serious nature at places other than the joints. It would seem worth while to construct crack-controlled bases on account of the fact that the promiscuous cracks which developed in bases constructed without joints with a subsequent filtering-in of the cushion material, followed by displacement of the brick over the cracks, have in many cases resulted in serious trouble on brick roads.

Joints should be carried through all integral curbs, regardless of whether they are constructed as flush header curbs or raised curbs. In the case of a raised curb of a concrete type, while it is cheaper to construct the curb integral with the base, there is a serious question as to whether it is not more satisfactory in the long run to construct the curb separate from the base, cutting it into sections 8 or 10 feet long. In case a curb is broken, damaged or disintegrated, as sometimes happens in exposed raised curbs, it is much more difficult to replace a section of integral curb than a separate one. Some concrete bases have been constructed recently with longitudinal concrete strips at 10-foot intervals which act as permanent traffic markers.

Where old pavements are used as bases, careful study should be made of their condition and value as a foundation. If there is any considerable doubt, there should be no hesitancy about removing sections of the old pavement and replacing with new base, because if a failure occurs in a few years, the surface material is the one which will be condemned by the public. Where widening and resurfacing are carried on at the same time, it is safer to anchor the new base under the edge of the old pavement, regardless of the extra width of base. Illinois has adopted this as a standard, and the state of Ohio has in a number of cases followed the same practice. The bedding course should not be required to fill up depressions so as to make the total depth of the cushion more than 1½ inches.

Several methods have been used to take out irregularities, one of them being a mortar coat 1:3 mix. This has been used extensively on the resurfacing work done by the Illinois State Highway Department, and, in addition to being economical, has proved itself to be satisfactory. Various types of bituminous mixes have been used, the most economical probably being the mixed-in-place type. Inspection of some resurfacing jobs built about five years ago without being leveled showed that where the bedding material exceeded 1½ inches in depth, there was a tendency for roughness to develop. The material in these cases was granulated slag, which has more stability than sand; undoubtedly a material which was likely to shift when used, would have caused serious difficulty. On the

other hand, there seems to have been no trouble reported or observed where the base course was leveled before spreading the cushion.

All cracks in old pavements should be sealed. There have been some cases reported where, even in spite of the fact that the cracks were sealed, the cushion had filtered in, causing disturbance in the surface.

A pavement should not be widened unless it is in good condition. If the condition is not good, it should be resurfaced as well as widened. In general, in widening, reconstructing and resurfacing a main highway it is better to do a first-class job by replacing sections of questionable value, correcting alignment and grade, and resurfacing, rather than to merely widen a road the condition of which is not entirely satisfactory. The cost per mile will be greater, but maintenance on the old portion is eliminated and the necessity for reconstruction of the original pavement within a few years is removed.

Many glaring examples of good and bad practice in this problem are in evidence. When a fine, well-constructed highway is built, it immediately draws the praise of those who use it. They do not seem to be so much interested in the fact that the job might have been cheaper by the elimination of some things, and the savings applied on some other road. On the other hand, where an effort has been made to spread the funds over a greater mileage by widening a pavement which should be reconstructed and failing to correct alignment and grade, it usually draws criticism, because here again the motorist, who is paying the bill, is interested in seeing the main highway system built properly, even though the other plan might do a few more miles per year.

Bedding Courses

There was a time in the history of brick paving construction when the bedding course was commonly referred to as the sand cushion. On account of the tendency of ordinary sand to shift under the brick and to filter into the cracks and joints in the base, other materials are gradually replacing sand. The ideal bedding material should compact readily and bond together or set sufficiently to prevent shifting and filtering into the cracks. In those localities where granulated slag can be obtained, its use has been generally adopted. It is the most nearly ideal of all materials from the standpoint of satisfactory results and on account of the ease of handling under all conditions. It can be rolled with a power roller so as to form a thoroughly compacted bed. It is ideal for resurfacing jobs where there is bound to be variation in the depth of the bedding course. Excellent results have been obtained by rolling granulated slag on resurfacing jobs, with a 10-ton tandem roller. To insure thorough compaction it should be sprinkled slightly whenever it becomes dry. This also supplies the necessary water for the setting action, which takes place slowly over a period of time. Fine stone and slag screenings have been used to some extent and, while they are not as satisfactory as granulated slag, they have given some good results; they should also be sprinkled before rolling.

A number of jobs are being laid on bituminous mastic material. The state of Illinois has successfully and extensively used this material during the past two years. On the work which was done last year, while in a few cases some difficulty was experienced in handling the material, excellent results were obtained; no evidence of failure has been observed. Some of the difficulties which were encountered in the handling of the material have been eliminated during the past year. Illinois is now using asphalt cutback of three different grades, light, medium and heavy, the grade used depending on the weather conditions. The material which has worked most satisfactorily with the cutback is bank sand; it seems to form a more stable mixture which will not shove or squeeze up between the brick when they are rolled. The sand must be dry and is usually mixed in a batch mixer or a pug mixer. The proportions specified are 92-95 per cent sand and 8-5 per cent bituminous material by volume. Care must be taken in wet weather to cover the mixed material so as to exclude water.

An item of importance in the preparation of a satisfactory bedding course is the use of a templet properly designed and constructed. Rigid specifications covering this piece of equipment should be included in all contracts. The templet should be made of good, sound hardwood at least 3½ inches in thickness, and should be painted. It should be reinforced on the back to prevent deflection, and braced over the top to prevent sagging; the bottom should have a metal cutting edge. It should be supported on each end by a frame consisting of a beam at right angles to the templet, each beam being supported by trucks at each end of the beam; each truck should have two rollers or discs, 24-inch centers for single trucks and 16-inch centers for double trucks. The truck should be connected by a pivot to the beam, and the over-all measurement should be not less than 10 feet. The ends of the templet should be fastened rigidly to the center of the beams and an adjustment provided so as to regulate the depth of the material.

Regardless of the material used for bedding courses, one of the fundamental necessities for laying and maintaining a smooth brick pavement is a firm and uniform compaction of the bedding material.

Rolling

The weight of the roller used on brick paving construction is a question on which there is difference of opinion. Some excellent results have been obtained by the use of a 10-ton tandem roller. A heavy roller cannot be used successfully where sand is used as the bedding material, and it is doubtful whether it would work successfully on a mastic cushion unless the bedding course itself was thoroughly compacted. It can, however, be used where granulated slag forms the bedding material; smoothness has been more easily obtained, and undoubtedly the brick are most firmly imbedded and will have more tendency to remain smooth than if a light roller is used. This is particularly true on resurfacing work where the depth of the bedding course is variable.

Fillers

The subject of fillers is perhaps the most discussed problem, and the question on which there are the greatest differences of opinions, of all problems in brick paving construction. Bituminous filler is the one now most generally used, although at the present time some experimental work is being done on cement grout fillers. A hard asphalt is generally considered the most satisfactory of the bituminous types. Emulsions have been experimented with considerably during the past two years, but in general have not proved satisfactory, owing largely to the uncertainty

of the results. Emulsions, however, have a distinct advantage in refilling jobs where it is necessary to do the work during bad weather. Approximately ten miles on Route No. 91 in Ohio was saved two years ago by this method. The brick had loosened badly during the winter months. The joints were refilled with emulsion during the late winter and early spring when any other filler could not have been used. The results were good and the pavement is in excellent condition today.

The most interesting development in the filler problem is the removal of the excess material from the surface of the pavement. The film of asphalt which always remains on the surface for some time after a job has been completed has been the source of trouble and severe criticism on account of causing slipperiness in wet weather and oftentimes stickiness in extremely hot weather. The Ohio State Highway Department, in connection with the brick manufacturers in Ohio, did a considerable amount of experimental work during the season of 1932, using several different materials and methods. The principal materials used were a solution of lime, a patented material known as B & B, manufactured in Cleveland, and a solution of calcium chloride. The principle of surface removal is to find something which will cause separation of the asphalt from the brick. It is not necessary in doing this to provide a film of any kind of solid substance. Ordinary water would do the job if the moisture could be retained for a sufficient length of time to allow the asphalt to be peeled; consequently it is only necessary to provide an agent of some kind which will cause the moisture to be retained a sufficient length of time to permit the asphalt to be removed.

Where lime was used, approximately one sack per 1,000 square yards provided enough solution. Where the B & B material was used, it required approximately 0.3-pound per square yard. Calcium chloride was made up in a solution of approximately 65 per cent water, 35 per cent calcium chloride, and a small amount, not to exceed 1 per cent, of laundry starch. Several different methods were used in applying the material to the surface of the brick. In some cases it was put on with a padded roller saturated with the solution; in other cases it was brushed on with ordinary pushbrooms. The method which seemed to meet with most favor was to spray it on through a fine nozzle, the solution coming through the nozzle in the form of fog. By holding the nozzle vertically over the pavement, the fog fell on the surface and did not get down along the sides of the brick, as it would in case the nozzle was held at an angle. The outfit used for this purpose consisted generally of a tank of approximately 15-gallon capacity, a barrel pump and air-pressure tank mounted on a carrying frame and wheels; and a hose about 12 feet long with a pipe extension rod connecting the nozzle completed the equipment.

The filler should be poured on the brick rather than applied with squeegee buggies, for it is easier to remove the material in thick sheets or strips than thin ones such as would result if applied with the squeegee buggy. The asphalt should be applied while the surface of the brick is still wet and should be peeled off as soon as complete settlement has taken place in the joints. It is best removed with straightened hoes used as cutting tools; it should be cut in strips about three brick wide and approximately five feet long. The cutting-off in small strips makes it easier to handle, and overcomes the tendency to pull some of the material from the joints, which sometimes results when too large a sheet is being handled. The material can then be put back into the kettle and reheated. Tests have not revealed that any appreciable difference results from the small amount of the solution which might be absorbed in the asphalt, after it has been reheated. It is advisable, however, to use at least 50 per cent new material in the kettles.

Some difficulty has been encountered in the use of whitewash, in that it causes foaming of the asphalt as it is applied. The lime in the removed material when reheated in the kettle also was the cause of some trouble by forming a coking on the bottom. This increased the cost of heating and occasionally necessitated cleaning the kettles. Neither foaming nor coking was encountered in the use of other materials. Very satisfactory results have been accomplished, and it is especially gratifying to drive over a newly completed pavement on which there is no filler adhering to the surface. There has been a considerable variation in the costs due to the fact that the problem has been handled in various ways, and for that reason some were able to do it more economically than others. The material itself is not expensive. There is some additional labor involved, but when the saving in asphalt as well as cover material is considered, it is thought that the cost will be increased but slightly if efficient methods are used. It certainly should be worth a slight additional cost to get rid of the menace of a slippery or sticky pavement.

Some experimental work has been conducted with grout fillers. In Mahoning County, Ohio, concrete base was constructed with transverse contraction joints at regular intervals, and longitudinal flush concrete curbs at 10-foot intervals. A longitudinal joint along the concrete curbs takes care of cracking. Over each contraction joint and along each curb, expansion joints were installed. The brick were then grouted in place. This provided grouted slabs of brick pavement completely separated from the base by cushion and from the sides and ends of the slab by expansion joints. On some other work in Ohio the same system was adopted for the transverse joints. The longitudinal joint was constructed by laying the brick up to a board or thin strip of metal lined up over the longitudinal joint in the base. After grouting, the strip was pulled and a bituminous joint poured. It will be interesting to observe over a period of years whether or not cracks develop in the surface other than those at the joints.

Some experimental work has also been done with a material known as temperature-resisting cement. The material is a mixture of ordinary cement and bituminous materials manufactured under a patented process. The theory is that the material has more flexibility, which tests have proved, and that it will be able to take care of both expansion and contraction without cracking. None of this material has been in use long enough as a joint filler to draw any conclusions, and time only will tell whether or not it will prove satisfactory.

Relaying Used Brick

Old brick pavements which have been in service for many years have been taken up, cleaned and relaid on a newly prepared bed on the old base. Some very good pavements have resulted from this plan. The cost is very difficult to estimate as a general proposition, because

labor is one of the principal items and labor rates vary considerably in different localities. The cost of cleaning is also dependent upon the type of filler used in the original construction. The cost of this work as reported from different projects has varied from $1 to $12 per 1,000; the general average of the salvage is from 75 to 80 per cent of the total brick taken up. Some information on this class of work shows the total cost of taking up, cleaning and relaying to be from 50 cents to $1 per square yard.

Maintenance

One of the most important items of maintenance of a brick surface is the sealing of joints in bituminous-filled pavements. Where joints have been constructed in the base and open up through the surface during cold weather, they should be sealed so as to exclude the water, which is damaging particularly during freezing weather. Failures and disturbance of the brick over these joints could result from this source more readily than from faulty construction or design of the joint. Where bases have cracked and the cushion material has filtered in, resulting in disturbance of the surface, the brick should be taken up, the crack sealed and covered, and the brick relaid to prevent further shifting of the cushion and disturbance of the surface. Sometimes patches of brick will loosen up during the winter months when the filler becomes brittle, especially where lugless brick have been used. Such places can readily be taken care of during unfavorable weather conditions by using asphalt emulsion.

Sometimes bases will develop irregularities due to uneven settlement of the base material, particularly where flexible types of bases have been used. In such cases the brick should be removed and the low places leveled up with bituminous cold patch material or cement sand mortar so as to permit a uniform depth of cushion rather than to fill up excessive depth with cushion material. Where concrete bases have completely failed, they can be replaced conveniently and quickly with high early strength cement. A pavement which is still in fair condition should always be repaired with brick rather than to attempt patching it with other material. Other materials should be used only in cases where the pavement is merely waiting for resurfacing or reconstruction.

EDITORIAL NOTE.—The members of this committee are: Chairman, H. G. Sours, County Engineer, Summit County, Akron, Ohio; John S. Crandell, Professor of Highway Engineering, University of Illinois, Urbana, Ill.; C. M. Hathaway, Construction Engineer, Division of Highways, Illinois Department of Public Works and Buildings, Springfield, Ill.; J. D. Harvey, Sales Manager, Southern Clay Mfg. Co., Chattanooga, Tenn.; G. F. Schlesinger, Chief Engineer and Managing Director, National Paving Brick Association, Washington, D. C.; and W. E. Sheddan, City Engineer, Jacksonville, Fla.

Citizen Support Essential to Good Government*

IT is no more possible to have good government without continuing citizen support than it is to have bad government without continuing citizen support. The difference of course is that the citizens who support bad government profit financially therefrom and are more likely to be on the job guarding their private interests than are citizens who are working for "good government" which all too frequently is but a vague ideal in their own minds. It is necessary, if we are to have efficient and effective government, to substitute something in place of the privilege, or job, or patronage reward which the party politician gets for supporting bad government, that the average citizen does not get for supporting good government.

There are many motives which keep men and women working together. The chance for personal gain is merely one of them. If we substitute "pride" for "profit" as has been done in Cincinnati and other cities, it is perfectly possible to build a citizen organization that will be able to defend good government against all comers. It is of course necessary to define what one means by "good" government—I mean government that is at once democratic and efficient, at once responsive to public opinion and capable of translating that opinion into administrative action promptly and efficiently, which means at as low cost as is possible, quality of service considered. I mean government, too, that is weighing the social and economic effects of its actions and endeavoring to adjust these actions to serve the community interest.

Such a government will make enemies almost as fast as —fortunately not faster than—it will make friends. It cannot be its own defender if it is to be efficient and keep politics out of administration. Some one else must fight its battle—and that means a militant citizen organization continuously alert to community problems and possibilities. Such an organization in a city with inefficient administration might well start out as a citizen's council, representing all groups in the population in a mobilization of civic energy and intelligence to the job of constructive economy.

Even where good government exists, a citizens' group must be constantly on the job, interpreting the government's work to the public and in turn interpreting the needs of the citizenship to the government.

The outstanding modern example of a citizens' organization successful in defending efficient non-spoils government is, of course, the Cincinnati City Charter Committee. It is non-partisan in the sense of being everlastingly against the spoils system; it is very definitely partisan in its advvocacy and defense of efficient government.

Urban life has become so complex that a liaison agency between the public and the local government is almost a necessity. If effective, this agency should—*must*—represent all groups in the community. It can achieve the combined purpose of keeping alive citizen interest in government, translating the requirements of the community to the government after the demands of each special group have been subjected to the scrutiny and paring criticism of the other groups, and insisting upon and defending efficient and effective administration. Eternal vigilance is the price of good government as well as of liberty.

HOWARD P. JONES,
Secretary, National Municipal League.

* Reprinted from *Public Management* for October, 1933.

The Threefold Task of Arson Squads

By **HORATIO BOND**
Field Engineer, National Fire Protection Association

ARSON squads are set up in most cities to investigate fires, particularly fires of incendiary origin. Their work may be roughly divided into three phases:

1. Investigation of Fires

The purpose of investigating fires and the making of a record of the details is to prevent another fire from the same combination of circumstances. The investigation is valuable as a disciplinary measure. The amount of investigation which fires are given at present is generally inadequate. Few fire departments investigate fires sufficiently, with the result that there is a lack of interest on the part of the general public in preventing fires.

The majority of fire alarms are inconsequential. About one alarm out of twenty involves a fire with a substantial loss, the investigation of which calls for a considerable amount of work on the part of the fire department.

Trivial alarms can be handled by a routine record, in a journal or on a blank, of such obviously important features as the location, date, time of the alarm, the names of owners and occupants, and the loss. This information is about all that is needed in connection with the great majority of alarms.

Especially in the case of fires involving a substantial loss, full data should be secured by investigation, and recorded. Of course, the usual details of location, date and time will be put down. There are many other important features. Any delay in the discovery of the fire or the receipt of the alarm may teach an important lesson about watchman or fire-alarm service. Details of the construction and arrangement of the building show how combustible construction and unprotected vertical openings may have contributed to the rapid spread of fire. Investigation of the cause of the fire will show the train of events which resulted in the fire. Investigation of the cause will also bring to light any evidence of incendiary origin which may affect the amount of ultimate investigation to be given.

A very important feature of fire investigation work which is usually neglected is the making of an inventory of the damage. It is necessary, for example, to indicate the extent to which the fire spread. The fire report should go further by listing the furnishings and material which burned on each floor of the building, and stating the damage to each. This information will assist the insurance adjuster in reaching a figure for payment which is fair but not excessive, and will also protect the fire department against any charge of uncraftsmanlike fire fighting. Details of how the fire was fought with special reference to operation of automatic sprinklers and also to the various companies of the fire department, are necessary in order to give a rounded-out picture of the fire.

Some arson investigation work has been left entirely to the police department. The experience with this arrangement is that the police do not have the fundamental interest or the necessary information to do good work in investigating fires. It has also been clearly indicated that any arson squad created should be in charge of the fire department and that the best men available for arson squads have been found among fire department officers who have a good background of practical fire experience.

2. The Checking-Up of Activities of Persons

This feature of fire investigation work is almost entirely in the category of detective work. It therefore requires a background of police procedure and experience in order that it may be effectively done. In practically all incendiary fires and frequently in others, it is necessary to do much interviewing of persons in order to find out what may have happened.

For these reasons it has been found important that the police department be closely identified with the work of an arson squad, but not necessarily in charge of it. In Detroit the matter is handled by the assignment of a detective from the police department who has charge of the squad but works under the fire department. His associates on the squad are men with practical fire experience. In Los Angeles all the members of the squad are firemen who have been given special training.

3. Preparation of Cases for Prosecution

After the physical features of the fire have been determined and the necessary evidence has been collected, it is necessary to organize this information and determine whether there is a sufficient case to secure a conviction, assuming that the fire appears to be of incendiary origin. This work is largely legal in character. It is often left to the prosecuting attorney's office, but unless the particular assistant prosecuting attorney available to the arson squad is particularly interested in the work, arson cases are neglected. They are difficult cases to prepare, and consequently prosecuting attorneys' offices tend to avoid them whenever possible.

Because of this, most of the successful arson squads have attached to them some individual who can do the actual work of preparing cases and making them ready to be taken into court by the prosecuting authority. A happy arrangement has been found in such cities as Chelsea and Springfield, Mass., and Charlotte, N. C., by the assignment of a fire department officer who also has completed legal training. Another plan, which has been worked out with good results in Dallas and Fort Worth, Texas, has been the assignment of an assistant county attorney as a member of the arson squad to prepare and prosecute cases.

Various special services must be provided if the arson squad is to function satisfactorily. Arrangements must be made so that stenographic help can be secured when needed and that chemists can be called upon for analysis work, and photographers for pictures of fires for use in evidence. These services can usually be obtained by arrangement with the police and other city departments.

Piping a Creek

Schenectady Enclosed a Stream as a Work Relief Project in Extending Its Storm Sewer System

By **H. B. PARKER**
City Engineer, Schenectady, N. Y.

THE natural topography of Schenectady divides the city into four distinct drainage areas which, including the areas outside the city limits naturally tributary, range in size from 1,300 acres to 3,000 acres. As the city developed and streets were paved, the creeks running through these areas were used as outlets for the necessary storm-water sewer systems, and consequently additional run-off, due to development and shortened time of concentration of the water, changed the simple creeks to streams of considerable size. Stream enclosure was undertaken only as the aggravated condition of the streams required it, and as a result a storm-sewer system of various types of construction and varying sizes was created for short lengths with open streams between. Increasing growth of the city brought these conditions to a point where the enlarged streams eroded the banks of the open channels and occasionally flooded adjacent property.

Comprehensive Plans for a Storm-Water Sewer System

In 1925 a study of the situation was started, with the idea of making a comprehensive plan for a storm-water sewer system for the entire city. The general plans have been completed, and from time to time construction of portions of the main outlets has been authorized. Any construction since 1925 has been so planned as to fit in with the general scheme.

In connection with work relief projects undertaken by the city, it has always been felt by the public works authorities in charge that a program of so-called permanent improvements was the most desirable form of work relief. With this idea in mind, a list of necessary sewer projects was submitted for consideration and approval. Some seven

RELIEF WORKERS EXCAVATING IN ADVANCE OF INSTALLATION OF PAVED INVERT PIPE SEEN IN THE TRENCH

LOCATION OF THE COWHORN CREEK ENCLOSURE PROJECT IN SCHENECTADY, N. Y.

DUMPING FROM THE RIGHT BANK WAS ENCROACHING ON THE STREAM

projects were approved and authorized, and a bond issue for materials, separate from the work relief bond issue, was floated.

A typical project undertaken is the enclosure of Cowhorn Creek from the Vale Cemetery property, easterly about 1,200 feet, at which point the stream flows through a ravine about 20 feet in depth. At this particular location, heavy storms and spring thaws always caused much of the bank to be washed down. Furthermore, abutting property owners were encroaching by filling in. These washouts and encroachments made considerable maintenance of the channel necessary.

The proposed project involved about 1,100 cubic yards of excavation, 1,200 linear feet of 54-inch pipe, the necessary manholes, etc. Considering this job as a work relief project, some thought was given to the kinds of sewer construction most adaptable to the type of labor available. As a result, it was decided to use Armco full-coated corrugated iron pipe, with semi-circular connecting bands, since it was the type most readily placed and joined under the conditions. Another reason which determined the use of this type of pipe was the fact that much of the pipe had to be laid and connected in the running stream.

Construction was begun about the first of May, 1933, employing on the average from 25 to 30 men. A hardpan stratum encountered in excavating the streambed slowed the work up to some extent. The pipe was quickly laid, however, in 8- to 14-foot lengths, and the joints were made withont any trouble. The type of connecting band used consisted of a semi-circular corrugated collar shop-riveted to adjacent ends of the pipe and bolted together in the field at the two sides of the pipe. The pipe was immediately backfilled with earth hauled in by truck. The project was completed during the summer just past.

The work was done under the general supervision of Fred W. Fisch, sanitary engineer, and construction was under the direct supervision of the writer and R. E. Rogers, assistant engineer.

Rates to Municipalities for TVA Power

TERMS and conditions for the sale of electricity by municipalities purchasing power from the Tennessee Valley Authority were announced on November 15 by David E. Lilienthal, Director in Charge of Power Development.

In making public the details of the initial TVA contract for the sale of Muscle Shoals energy, Director Lilienthal also made known the industrial and commercial rates which supplement the Authority's standard residence and wholesale rate structure made public September 15 last.

The basic industrial rate specified in the agreement with Tupelo, Miss., follows:

Available—To industrial power users having demands in excess of 10 kw service at primary distribution voltage or secondary distribution voltage at discretion of municipality.

Demand Charge—$1.00 per kw per month. Demand—Maximum integrated 30-minute period.

Energy Charge—

First	10,000 kwhrs	per month at	10 mills per kwhr
Next	25,000 kwhrs	per month at	6 mills per kwhr
Next	65,000 kwhrs	per month at	4 mills per kwhr
Next	400,000 kwhrs	per month at	3 mills per kwhr

Excess—Over 500,000 kwhrs per month at 2.5 mills per kwhr.

Minimum Monthly Bill—$1.00 per kw of maximum demand, but in no case shall the maximum demand for billing purposes be taken as less than 60 per cent of the maximum monthly demand billed during the preceding 12 consecutive months period. Service taken under the small power rate will be subject to minimum bill prescribed for commercial customers.

Small Power Rate—Customers having a load of 10 kw demand or less to be billed on basic commercial rate.

Surcharge—Basic rate (including small power rate) subject to a surcharge, initially established by municipality and modified from time to time as net revenues improve. Surcharge to take the form of straight percentage added to customers' bills.

Seasonal Loads—The municipality may at its discretion discontinue service as seasonal loads and establish a minimum payment for idle months sufficient to cover costs involved.

On this basis, a certain large cotton mill at Tupelo will effect a saving of nearly 45 per cent, or more than $1,500, on its monthly power bill.

The basic commercial rate, as announced in the Tupelo contract, is:

Available—To commercial customers taking service from the municipality's secondary system:

First	250 kwhrs	per month at	3c per kwhr
Next	750 kwhrs	per month at	2c per kwhr
Next	1,000 kwhrs	per month at	1c per kwhr
Excess			

Over 2,000 kwhrs per month at 0.8c per kwhr

Minimum Monthly Bill—

5 ampere meter— 50 kwhrs.....	$1.50
15 ampere meter— 66 2/3 kwhrs.....	2.00
50 ampere meter—100 kwhrs.....	3.00

Surcharge—Basic rate subject to a surcharge initially established by municapility and modified from time to time as net revenues improve. Surcharge to take the form of straight percentage added to customers' bills.

Under this contract a user of 500 kilowatts of commercial power per month pays $13.75; a saving of $20.25 as compared with the present Tupelo rate.

The 20-year agreement between the TVA and Tupelo is expected to set a standard for contracts with other municipalities within transmission distance of Muscle Shoals. Besides rate schedules, the Tupelo contract carries with it certain rules and regulations applicable to all TVA customers. Details may be had on application to the Tennessee Valley Authority at Washington, D. C.

Tupelo is expected to use Muscle Shoals current on February 7, 1934, when Tupelo's contract with the Mississippi Power Co. expires. The Authority will cooperate with Tupelo in encouraging a wider use of electricity, and plans an intensive demonstration in rural electrification in the heavily settled county of Lee, of which Tupelo is the county-seat.

The Snow Must Go —

Frink Sno-Plow and Leveling Wing Owned by the Town of Mexico, N.Y. Clearing a County Road at 25 m.p.h.

A Cletrac Model 80 and a Sargent V-type and Wing Plow Operating in a Heavy Snow near Plattsburg, N.Y.

A Monarch Standard 8-foot Snow Plow mounted on a Chevrolet Truck

Two Allis-Chalmers Model U's Equipped with a Snow Brush and a Sidewalk Plow Clearing Snow from the Municipal Skating Rink in Boston, Mass.

One of the four Caterpillar Tractors Owned by the Village of Winnetka, Ill. Clearing the Sidewalks at 4 A.M. on February 8, 1933

Tax-paying Drive Successfully Organized

By REGINALD PARNELL
Director, Department of Revenue and Finance, Newark, N. J.

UPON assuming office in May of this year and having had assigned to me the directorship of the Department of Revenue and Finance of the city of Newark, not the least of several unfortunate financial situations confronting the city was, in my opinion, that of delinquent taxes. The records disclosed that the city was owed, in arrearages, approximately $21,000,000. The graph had been rapidly mounting. It traveled from a delinquency of $98,528 in 1917 to the alarming figure of $9,917,577 for the year 1932. What to do?

In line with what I believe to be a sound public policy —today as never before—I asked the citizens themselves to come to the rescue. Twenty of our largest taxpayers were called together in conference. Before them I placed the city's financial plight, laying particular emphasis upon our already stupendous but ever mounting, tax delinquency. I suggested to these gentlemen that if this delinquency had to be carried over and provision made for it in the 1934 budget, it would mean a substantial increase in the tax rate. They readily grasped that this would involve another large burden at a time when they, the taxpayers, could ill afford it. They were quick to see that it was a problem with which they, themselves, were directly and intimately concerned. After considerable discussion, I suggested that a tax drive organized along Community Chest lines might offer a real solution. They suggested that I head such a drive. This I refused to do. I told them frankly that it should be a citizens' drive and that officialdom should be kept very much in the background. I expressed the opinion that officialdom had played a large part in bringing the city of Newark to the brink of financial disaster.

Recruiting the Campaign Organization

I suggested to the group of large taxpayers that every one of them controlled an organization which had within its personnel men highly qualified to assume the leadership of the contemplated undertaking. They were quick to grasp the point and openly expressed themselves as able and willing to loan to the city of Newark two of their best organizers for as long a time as might be necessary to whip into shape and make the drive a reality. This was accordingly done. In a short while high-calibered executives were daily found in the office of the Director of Revenue and Finance. Most of them had never placed foot in City Hall. Most of them knew little or nothing about taxation, its problems, or its ramifications. In the space of a few days, however, there came into being in a very thoroughgoing manner one of the finest campaign organizations which this city has seen.

Within the hands of this working committee was left the entire management of the drive. I am informed that every member of this committee reported to the head of his concern the progress which had been made each day. A complete search was made covering a period of five years of every tax delinquent and of each current tax debtor. The city was divided into 42 districts. A captain was placed in charge of each district. Each of the large business houses and corporations contributed from ten to forty workers for actual solicitation. These same concerns also gave two men each for three weeks to work as full-time team captains. Some 500 school teachers likewise volunteered their services. Rallies were held throughout the entire month of October. Newspapers, radio stations, billboards, trolley cars and busses were marshaled and used in an endeavor to bring before our citizens their responsibility and also to generate enthusiasm.

Approaching the Tax Delinquents

To every solicitor were given from 35 to 40 pledge cards, setting forth thereon the amount of the taxes by years owed by each particular individual. This was accompanied by a book of instructions telling how to approach a tax delinquent and explaining the various objections with which the solicitor might be confronted, together with appropriate rebuttal arguments thereto. The instructions also pointed out the four ways in which taxpayers might liquidate their obligation to the city of Newark; that is, by semi-annual, quarterly, or monthly payments, or by the 60-payment plan known as the budget plan.

The solicitor approached the taxpayer in a spirit of good-will and cooperation. The city's situation was explained to each taxpayer and the methods of payment. The taxpayer was asked to sign a pledge to pay his taxes by a definite time. Approximately 15,000 pledge cards were signed and returned to my Department. Our receipts in the month of October jumped from $1,075,128 in 1932 to $2,224,905 in 1933. Besides this, taxpayers have definitely pledged themselves to pay $6,479,451 within the next six months. In spite of the fact that October payments increased so perceptibly, our November payments are still showing an increase over November, 1932, of from ten to fifteen thousand dollars daily.

The city of Newark is now tax-conscious. A new spirit seems to be in the air. This is due in great measure, I think, to the fact that every solicitor went forth as an apostle of good-will, attempting to build up a new relationship, a new attitude upon the part of the public towards city officials. I believe that tax collection in Newark has received, as a result of this drive, an impetus that will survive for many days to come.

Methods of Dealing with Tax Delinquents

See THE AMERICAN CITY for August, 1933, page 36—"Methods That Have Proved Successful in Collecting Delinquent Taxes," by Carl H. Chatters; also the November issue, page 41—"Receivership for Tax Delinquents," by Mabel L. Walker.

Installing a 60-Inch Cast Iron Water Main as Part of an Emergency Relief Program

Buffalo, N. Y., Recently Completed the Laying of 3,200 Feet of Duplicate Discharge Main

A NEW extension to the water system of Buffalo has just been completed as part of the emergency relief program. A duplicate 60-inch discharge main was laid in Porter Avenue, from the Colonel Francis G. Ward pumping station to Prospect Avenue, to insure a more adequate supply for that portion of the city on the high-service system, which supplies four-fifths of the water consumption of the city of Buffalo. This 60-inch discharge main drops 65 feet and passes through a tunnel 213 feet long under the Erie Canal. The installation comprised the laying of approximately 3,200 feet of cast iron pipe, 60 inches in diameter, which was supplied by the United States Pipe and Foundry Co.

In 1914 the increased demand for water made it necessary to erect a new pumping station at the foot of Porter Avenue and install two 60-inch discharge mains to connect the new pumping station with the existing trunk mains on the high- and low-service systems. Cast iron pipe was selected, and a reinforced concrete tunnel 10 feet high and 20 feet wide was constructed beneath the Erie Canal to carry the pipe. At that time it was thought possible that at some future date there might be need of a duplicate line, and provision was made for it in the tunnel. Access is gained by means of a vertical shaft at either end, and the original cast iron pipe was laid down each shaft and through the tunnel.

THE PIPE LINE TO THE CANAL, SHOWING THE TWIN LINES ON THE OPPOSITE BANK

LOWERING A 60-INCH PIPE INTO THE SHAFT

LOWERING A 60-INCH WYE BRANCH

In 1932, in connection with the emergency relief program of Buffalo, it was decided to install this auxiliary feeder under the Erie Canal. To enable as many as possible of the city's unemployed to secure jobs on the work, hand labor was used wherever possible. The cast iron pipes to be installed in the tunnel were lowered down the shafts at each end by a gin-pole crane and were hauled through the tunnel into place by means of cables and winches. Wood plank skids were used, on which rollers were placed to skid the pipes in as easily as possible.

Drainage Difficulties

Considerable difficulty was met in the job by reason of the leaky condition of the tunnel. Continuous pumping was necessary at all times to keep the water level low enough to permit the men to work. The water entered through cracks in the tunnel and shaft walls. Another source of trouble was the many springs in the trench, which necessitated continuous provision for drainage before the work could progress. The ground water was pumped out, and was by-passed or drained into existing sewers. Other underground structures necessitated cuts as deep as 17 feet in some places.

The parallel lines are tied together and provided with division valves at several points. A direct connection exists at Porter Avenue, beyond Prospect Avenue. Indirectly, they are tied together through by-passes to the old 36-inch feed lines, and also at a 48-inch feeder. The joints of the 60-inch cast iron pipe line are bell-and-spigot; the joint material used in one-third of the joints is lead, and in the remainder Hydrotite was used. The pressure on the line is 85 pounds per square inch.

The installation was made by Division of Water Extension employees working with unemployed men from the city of Buffalo. The work was done under the supervision of Howard Fitzgerald, Chief Engineer in charge of pumping stations and filtration, and W. J. Grotz, Engineer.

ACKNOWLEDGMENT.—The illustrations for this article have been furnished through the courtesy of the U. S. Pipe & Foundry Co.

INSTALLING THE NEW LINE IN THE TUNNEL

A GOOD ROADS CHAMPION MODEL 16-D SNOW-PLOW WITH HYDRAULIC LIFTING DEVICE, REVERSIBLE MOLDBOARD AND FLARE PLATE, OWNED BY THE BOROUGH OF KENNETT SQUARE, PA.

Disposing of the Garbage of 11,500 Households

The Collection and Incineration System of Muskegon, Mich.

EVERY superintendent of a garbage incinerator wishes that the watermelon, the corn husk and wet weather had never been invented. Add to these the canning season of the increasingly prudent housewife, and the incinerator superintendent's nightmare is complete. It takes constant attention to the husbanding of dry combustibles to keep the fires of an incinerator going satisfactorily at those times. At Muskegon, Mich., all the garbage of the city is incinerated in eight hours each day in a three-cell Bartlett & Snow Sterling incinerator.

A city ordinance requires that the householders wrap every bit of garbage that goes into the refuse can. This furnishes much needed fuel for the incinerator where other rubbish is not delivered to the plant. The feeding holes are so small that it is impossible to feed tree cuttings to the fires, and this also excludes other somewhat bulky combustible material which might help the fires in wet weather.

The population of the city is 44,000 and it has an area of 8.78 square miles. The city is rather elongated, being 5 miles long and averaging 1¾ miles wide. There are twelve collection routes in the city, including East Muskegon, now a part of the city of Muskegon, and these cover a total of 11,500 individual collection stops. The routes are covered twice a week throughout the year. Hotel and restaurant garbage is collected by private collectors and delivered to local rendering plants.

The city collection fleet consists of eight Ford and Reo trucks of 1½ and 2 tons capacity, with Wood hydraulic hoists and steel bodies. The trucks start out on their routes at 6.30 in the morning and are through for the day when that day's route is completed. They are required to go back on their own time if there are any complaints of missed collections. Each truck has a driver and a helper, and both handle the collection. The collectors go into the property and empty the householder's garbage can into a galvanized iron bushel basket, two of which are carried on each truck, the basket is emptied into the truck, and the collector continues on to the next property. The galvanized iron containers have rope handles as being a little less hard on the hands of the men and a little less likely to be knocked out of shape when the containers are hung on bolts in the tailgate of the trucks while driving to and from their collection routes. When the loads are completed, they are covered with a canvas to prevent odors and to reduce the fly nuisance.

ONE OF THE COLLECTION TRUCKS, SHOWING THE GALVANIZED BASKETS HUNG ON THE REAR

The Incinerator

The dumping pit at the incinerator is outside the incinerator building proper and is large enough to accommodate two trucks dumping at one time. The pit has a one-day storage capacity and the charging floor has a similar capacity, giving the plant two days' storage capacity. A man is employed to clean up at the edge of the pit and also to work in the pit picking out large tin cans and tossing them out the back door for hauling out to the clinker dump. A Bartlett & Snow apron conveyor runs along the bottom of the pit and carries the garbage up to the second floor of the incinerator building, dump-

THE MUSKEGON INCINERATOR
At right the dumping pit, from which the refuse is carried to the charging floor by a belt conveyor

ing it onto the floor in front of the three firing holes.

The incinerator is able to burn the accumulated garbage of the day in eight hours. The fires are started at 6.30 A.M., and burning is started as soon as they are hot enough to take care of the garbage. The incinerator dumping pit is open until 4.45 P.M. for the receipt of garbage delivered by private trucks and for the killing of dogs and disposal of their carcasses by burning in the combustion chamber. The plant foreman reported the burning of the complete carcass of an elephant in the combustion chamber in three hours.

The plant is operated by a foreman and from three to five men, according to the amount of garbage received. The garbage is fired to the furnace through the three charging holes, which have two sets of doors. The upper set are set at an angle and drop when the charge is to be released into the fire. The second is a single sliding door operated by compressed air. A Curtis air compressor on the charging floor is used to provide the air for operating these gates. The conveyor and the compressor are electrically driven.

A day's work usually consists of the incineration of about 55 loads of garbage delivered by the city collection trucks and 6 to 8 loads from private sources. The draft for the fires is taken from two sources. A large draft tube on the loading floor takes the air from there and another on the stoking floor keeps the smoke and flying ash that might result from clinkering from getting into all parts of the building and out into the surrounding community. The fires are clinkered once a day at the close of the run.

The plant is nine years old. It is built of gray brick and has a concrete tile roof. The stack is 125 feet high and 6 feet in diameter at the base. A shower bath and lavatory are provided for the men on the firing floor. No ashes are delivered to the incinerator nor is combustible refuse accepted, other than garbage. All loose refuse like paper and tree clippings is burned in an outdoor incinerator near the main structure. The ashes are used for fill in the nearest low spots to their point of origin.

The operation of the incinerator is under the direction of the Department of Public Works, of which H. J. Lewis is Director.

Observations of Sanitation Activities in German Cities

By **ALBERT E. NEALE**
City Auditor, Springfield, Mass.

EDITORIAL NOTE.—*The author was one of a group of municipal officials from American cities who made a trip to Germany to study German municipal administration under the auspices of the Oberlaender Trust of the Carl Schurz Memorial Foundation from June 8 to August 5, 1933. While Mr. Neale's chief interest was in studying financial and welfare methods, he brought back some interesting observations regarding sanitation.*

In Magdeburg

IN Magdeburg the city cleans only the main streets, while the remainder of the city streets, mostly residential, are kept clean by the householders, who are fined by the police if this work is not done. The police check up on Wednesdays and Saturdays. The city charges 48 pfennigs per cleaning for the streets which it does clean. This work is done two or three times a week. Garbage and refuse collection in Magdeburg is handled by a private company. All the sewage now goes into the Elbe River. Formerly it was treated, and the sanitary police are now requesting that the city return to the use of the sewage disposal plant.

In Dresden

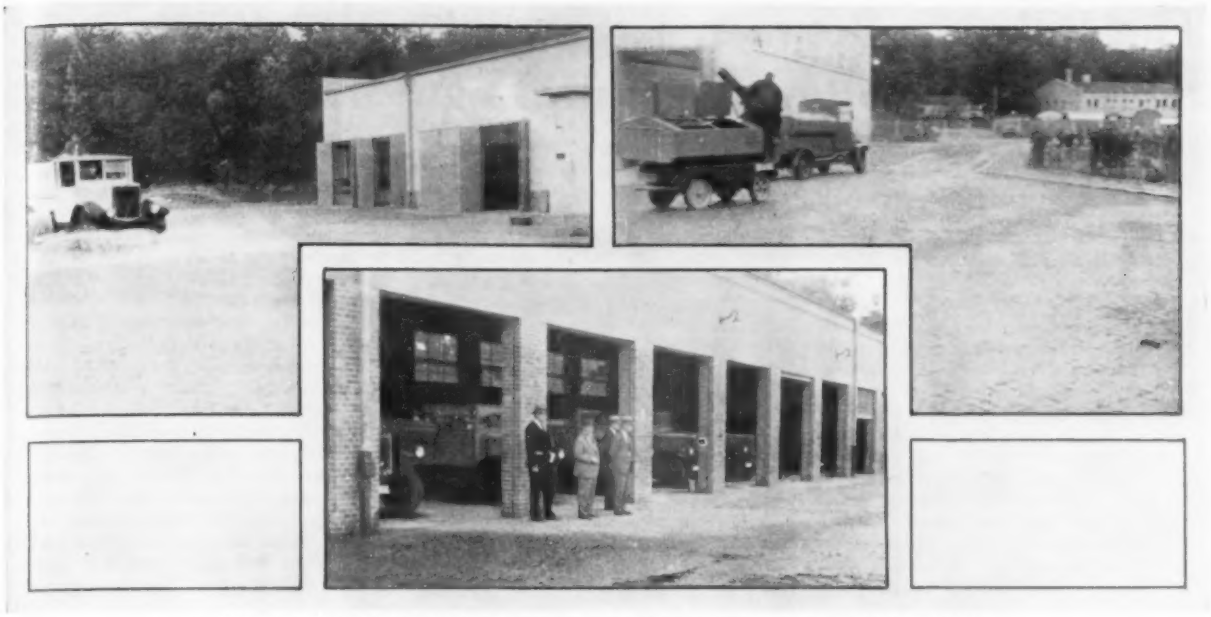
In Dresden refuse collection is handled by a private concern which has entered into a contract with the city. This organization is a company in which the city holds stock. The collections are made according to ordinances, which are enforced by the city officials. All types of refuse, include garbage and ashes, are collected in one can and are disposed of by filling in land owned by the company. The stock company collects only from homes and other places where the refuse is placed in cans. In addition to the stock company which makes the major part of the collections, there are many small companies operating and collecting from what are termed "refuse holes." Refuse is thrown into holes in the ground instead of being put into cans, and is removed at irregular intervals. These two types of collection are not satisfactory to the city because of the objections from health officials, and the city is contemplating taking over and operating the entire refuse collection service itself.

New street construction in Dresden is handled entirely by contract with private companies, although the city operates three large stations for equipment used in maintaining and repairing its streets. At the present time only 300 men are employed in street repairing, whereas the normal number a few years ago was 1,000 men. The street cleaning division employs 500 men at 6 marks per day. Of these, 400 use push brooms, for only the asphalt streets are cleaned with machines.

The city of Dresden does all its own engineering and planning for sewers, but construction is done under contract. About 100 men are employed cleaning sewers, some of this work being done from boats in the larger trunk sewers. The sewage goes to one large central sewage disposal plant.

In Leipzig

In Leipzig all new street construction is done by contract, although there are 200 men employed in street repair and maintenance and 700 men in the street cleaning



SCENES AT A SANITATION DEPARTMENT SERVICE STATION IN LEIPZIG, GERMANY

division. The collection of garbage, ashes and other refuse is done entirely by private companies. The situation is about the same as that existing in Dresden, the health officials objecting to the methods of collection. Leipzig also is contemplating municipal collection. The city does not operate an incinerator, all of its refuse being used as fill to build a three-terraced hill to be about 70 meters high when completed and to be used for winter sports, including skiing and sliding. The private companies which collect the refuse are paying a fee to the city to dispose of the refuse at the point where the hill is being built. The first step in the building of this hill was to dig pits, approximately 50 square feet, laying aside the good loam and soil to be used later in covering the refuse. The city sewage was then pumped from the sewage disposal plant into the pits and allowed to settle. After a certain length of time the dried sewage was placed on top of the refuse and then covered with good loam and soil. It is understood that other cities are using the same method for disposing of refuse. In Leipzig there are about 2,500 dwellings with dry toilets, and the city operates a machine which pumps the refuse from these toilets, later selling the material to the farmers for fertilizer.

Two service stations were visited in Leipzig and the buildings and equipment inspected. The buildings were in good repair and were models of cleanliness. Practically all the equipment was new and was kept in excellent condition. Both stations have flower gardens in the station yards and many flower boxes in the windows, which do much to enhance the appearance of the buildings and grounds.

German cities have always been noted for their cleanliness. In the cities visited, the streets were found to be much cleaner than in the average American city, and in Leipzig inquiry was made as to how it was possible to keep the streets so clean. It was learned that one of the reasons was the fact that the German people are naturally more observant of all rules and regulations and are taught even from early childhood to take pride in keeping their city streets clean. The school children are instructed through placards in the schools and by the school teachers as they escort the pupils through the city streets. In Leipzig there are over 3,000 refuse receptacles scattered throughout the city, which are emptied two or three times a day. The street cleaning department maintains a special corps of men at the railroad station and other important places to keep such areas particularly clean, so that the first impressions of visitors will be favorable. The men engaged in street cleaning in Leipzig are required to be clean in appearance, and adequate wash room facilities are provided at each service station for their use. The equipment is kept clean and in good repair. The superintendent feels that with clean men, clean equipment, and strict methods of operation a high standard of sanitation can be maintained.

It may truly be said that some of our American cities can learn much from German cities in regard to street cleaning methods. American cities would undoubtedly have cleaner streets at a reduced cost by putting into effect, to a certain extent, some of the German ideas, particularly the idea of educating our public to take pride in helping keep our streets clean by a better observation of our sanitary rules an dregulations.

The Public Library to the Rescue

"The public library as an educational and recreational institution tries to meet a situation which has unbalanced the country. If the idle worker has a place to spend his time in improvement, looking toward his future employment—and at no cost—the library is the right spot. If the business man gets even one idea to put his project on its feet, the library has given him aid. If the discouraged have found some solace, spiritual or otherwise, in books, Heaven be praised! If the countless questions that a librarian answers every day help the world in general, the library has truly served. But its work is quiet and inconspicuous—even secretive. It does not get the publicity of other secretive organizations, however. We may even admit that the library might become more popular if it sometimes left its dignified pedestal. The bright side of inflated library service in a deflated community is an inner feeling that the library is proving its great point of usefulness in spite of its minimum rations."

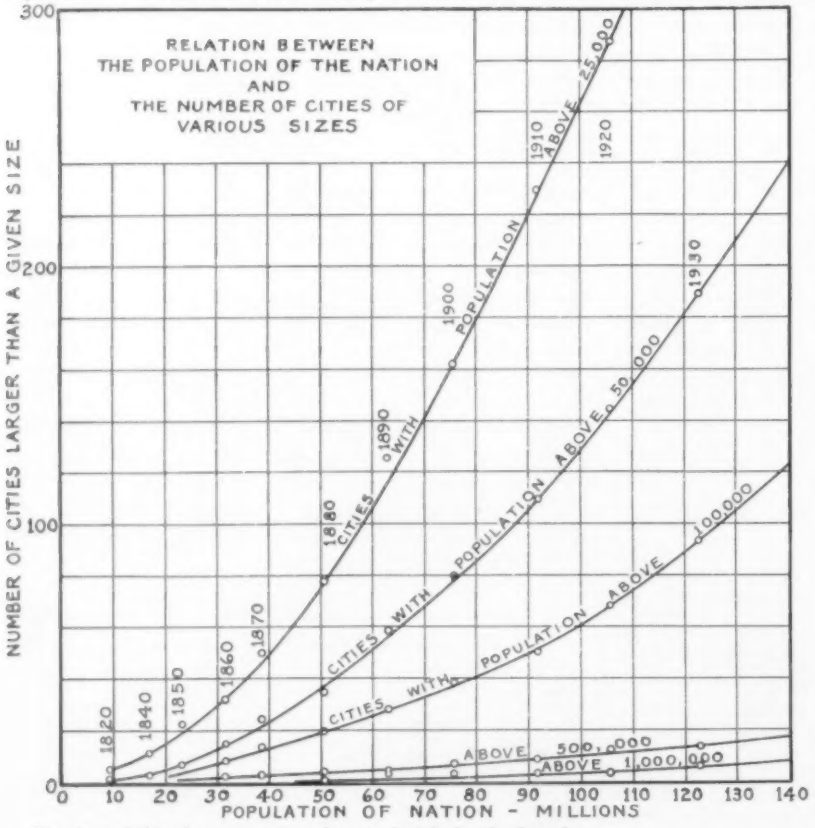
—Excerpt from a radio talk by M. Margaret Kehl, of the New York City Municipal Reference Library, November 13, 1933.

The Relation Between Large and Small Cities Follows a Natural Law

To the Editor of THE AMERICAN CITY:

It is possible to prove by the methods of plain geometry that one equals two, if a distorted figure is drawn and a false assumption made at the start of the demonstration. This is what Mr. Klaber unconsciously did in his article, "Why the City of Medium Size Will Be the City of the Future," in THE AMERICAN CITY for September, and Mr. Olds, in the October number, fails to find the fallacy. Mr. Baily, in discussing the same article, ignores Mr. Klaber's diagrams, and arrives at logical conclusions on slightly different subjects.

The "well-planned neighborhood units" are not points, as Mr. Klaber draws them, but are instead spaces between main highways. Actually, there is no highway or other direct connection from each "unit" to every other "unit." The traffic comes from the interior of the unit to the highway going in the general direction it wishes to take, where it joins with traffic from other units. The traffic between units varies inversely as the square of the distance between them (assuming that all "units" are of the same size). Therefore, the traffic on the main highways does not increase in direct proportion to the number of units along it. The "units," in "Megalopolae" and "Metropolae" are not arranged around the periphery of the city, but, if properly planned, are distributed more or less uniformly over the whole area, with the spaces between them occupied by the larger parks, industrial areas or business districts. Thus, there are no more main highways in one "Megalopolis" of sixteen units than would be needed for the combination of four "Micropolae," containing the same number of units, but in the larger city, streets of greater capacity might be needed. In the "Megalopolis," the total length of highways would be less, and the interchange of goods between the units would increase inversely as the square of the distance between them. "Micropolis" is suited to the leisurely business of a community of retired business men and farmers; and it is nice to contemplate that there are, and will continue to be, these delightful places for retirement after a sufficient financial reserve has been laid aside.



The data of this chart are expressed approximately by the formula,

$$y = \left[\frac{x}{2.35\ p^{0.6}}\right]^{1.75}$$

where y = the number of cities, larger than a given size, in the nation.
x = the population of the nation, *expressed in millions.*
p = the population exceeded by the y cities, expressed in *tens of thousands.*

Solving for cities of over 25,000 in the United States in 1930, this formula gives 380, instead of the actual number 376, which cannot be shown on the above chart.

The "Megalopolis" is a more efficient place in which to transact business, and amass the reserves necessary to live in these delightful little cities where business opportunities are few. As the average size of transactions increases, the advantage of a large number of people congregating together increases. The metropolis is needed for the transaction of business on a large scale, or in expensive commodities, where interest on the investment during transportation and while awaiting sale becomes an important item. The metropolis is efficient, in spite of its defects at the present time. These defects are due to congestion rather than size, and are the result of lack of planning in the past. Congestion is not confined to metropolae, but is also found in cities of less than 50,000 population.

The accompanying figure shows the number of cities of varying sizes, in the United States, at different census periods since 1820. It will be seen that there is a natural law controlling the number of cities of different sizes, and that the 1930 figures do not show any change in the regular trend that has been followed since 1820 or before. The same relations have been found in data from other countries. To find that the world is still prosaically following natural laws which have been operating for some time, is uninteresting, as it does not supply any lurid headlines about "Big City K-Oed by Its Little Brother." As a matter of fact, the *number* of *people* in the smaller cities is less than the number in the larger ones. While the total population in the smaller cities is increasing at a faster rate than in the larger cities, this rate is decreasing for all cities, and becoming more uniform. These tendencies will continue in the future as they have in the past, unless some unforeseen disaster puts an end to the cycle of natural and economic laws under which we are now living. In advocating planning for large cities as well as small ones, we are not "defending the large city," but merely suggesting that each city should be designed for the size which it will probably attain.

CHARLES HERRICK,
Member, American City Planning Institute.
Yonkers, N. Y.

Mr. Klaber's Rebuttal

To the Editor of THE AMERICAN CITY:

I have read Mr. Herrick's article. I think a word should be said on the nature of a graph. It should be recognized that graphs such as he has shown are an empirical plotting of experience, and not the expression of a mathematical law. His main error is to presume that because under a system of anarchic development the trend of experience appears to be fairly constant, this trend was inevitable and the expression of "a natural, economic law." To accept this thesis is to pretend that man's economic fate is entirely outside of his control. Give me the necessary authority and I will twist any curve into a bow-knot and head it in the opposite direction.

EUGENE H. KLABER.

FORWARD STEPS

Reported by
Municipal Officials, Chamber of Commerce Executives, and Others

Equipping the Park for Recreation

UPPER DARBY, PA.—The small streams and wooded areas in Upper Darby, Delaware County, Pa., were rapidly disappearing in the path of the real estate developer. In ten years the population had increased from 10,000 to nearly 60,000 and in all of the nine square miles of area there was no municipal park. The harassed city fathers were hard pressed by the rapid growth, to make even the most essential improvements, and the matter of parks was neglected.

In 1930 it was seen that immediate action must be taken to preserve some of the natural beauty for the future, and a tract of 26 acres was purchased. The ground lay along the bed of a stream in what was known locally as the "Valley of the Seven Springs," and had an abundance of old shade. The use of a larger adjoining tract was also secured.

The park lay neglected until the depression years of 1931 and 1932, when unemployed citizens without the funds for other recreation began visiting it in large numbers. This increasing use of the park tract indicated the advisability of some immediate improvements, so an exceedingly modest appropriation was made for this purpose. The amount accomplished by the judicious expenditure of this money was surprising.

The stream bed was cleaned of rubbish accumulated through the years, and three rustic footbridges were built. Long-forgotten springs were cleaned out, sealed, and piped to drinking fountains. The water from these springs is excellent, and periodic testings for bacteria guarantee its safety.

Fortunately, an outfall sanitary sewer ran through the property, and it was a simple matter to connect comfort stations with this sewer, using water from one of the springs. As all water used in the park flows by gravity, operating costs are kept to a minimum.

Storm shelters were erected, combination picnic tables and benches built, and a masonry dam was thrown across the stream to form a wading pool. One of the least expensive but most appreciated improvements consisted of the construction of eight stone fireplaces throughout the park. These are equipped with grates for cooking, and are much in demand by Boy Scouts and others who enjoy preparing a meal out of doors.

In 1933 a further appropriation was made. As this is written, several tennis courts are being constructed, and an order has been placed for swings, teeterboards, slides, and other equipment for the smaller children.

This is a park for recreation. There are no close-cropped lawns nor flowerbeds, and no signs to say, "Keep off the grass." Hundreds use the park daily. Nature study classes visit it, and the Delaware County Federation of Women's Clubs has established a bird sanctuary here.

The cost of improvement has been most moderate, and the upkeep requires but two men, one by day, the other at night. The wholesome recreation given to unemployed citizens has done much to bolster up their self-respect and morale, and has thus done far more for the future welfare of the community than any other possible expenditure of the same amount of money.

WILLIAM W. REEDER,
Assistant Engineer, Bureau of Public Works.

RUSTIC BRIDGE AND FIREPLACE IN THE UPPER DARBY PARK

CHILDREN ENJOY SWINGS AND POOL

Profitable Utilities; No Bonded Indebtedness

ESTHERVILLE, IOWA.—Because of the great success which this small city has had in owning and operating its municipal light, power, gas, water, and municipal swimming pool plants, the following brief statement may be of interest.

On December 29, 1891, Estherville voted in favor of the construction and operation of an electric light and power plant, and a steam plant was constructed at that time. At a special election on June 4, 1894, the city voted to construct and operate a water plant and distributing system. These plants, which were built soon thereafter, were somewhat crude in comparison with our present up-to-date plants, but were in keeping with the general knowledge and the modern conveniences of that date. At that time the plants were not financially profitable, but they gave to the people a start in supplying the community's needs.

In 1914 the steam plant unit was replaced by a Busch-Sulzer diesel oil engine unit. This was the real starting date of the financial success of Estherville's public utilities. Three more Busch-Sulzer units have since been added to this plant as the demand for more service required, and, likewise, the water system has been improved, expanded and extended.

In 1917 the city constructed an artificial gas plant and distributing system. This plant also has been improved, expanded and extended.

These three plants are located close together, with the resulting advantage that they can be supervised by a single plant foreman. He has a three-shift engineer force in the light and power plant, and an engineer in the nearby gas plant. The city's water pumps, located at the different city wells, are also operated from the main power plant.

Many years ago the city was able to pay off out of its utility earnings all of the bonded indebtedness which had ac-

cumulated from the construction and development of these plants. Since that time we have constructed a city hall and fire station, for about $20,000. Outgrowing this city hall, we later constructed a new city hall, fire station, city offices, etc., at a complete cost of about $80,000 and constructed and put into operation a municipal swimming pool in one of the parks for about $25,000. We also resurfaced all the paved streets, for $26,000.

During the last two years we have reconstructed one of the old city wells and have purchased a new location at which two new city wells have been constructed. All these wells have been provided with new equipment. We purchased a new location and constructed a new 300,000-gallon water-supply tank and tower, made many changes, and laid additional water mains, altogether totaling $40,000. The cost of constructing an additional main trunk sanitary sewer line was $8,000; of reconstructing the street-lighting system, $10,000; and providing park beautification, $1,600.

Four short sanitary sewer branches to the main trunk sanitary sewer line are being completed at a cost of about $1,000. Also, plans and specifications are rapidly being completed to construct another separate sanitary sewer trunk line of about ten blocks at an estimated cost of about $12,000.

All these improvements were paid for out of the utility earnings, and we have no bonded indebtedness. On November 1, 1933, there was a cash balance in the city treasury of $65,191.66 deposited in our banks under state guarantee protection. On April 1, 1933, the inventory of the total of Estherville's municipally owned property was $737,474.57.

No charge is made for pumping and operating the city wells and water system, or lighting the streets, municipal buildings, city and state parks, public library and rest rooms.

R. O. CLARK,
City Clerk.

Beauty of Park Preserved by Concrete Bridge

WASHINGTON, D. C.—The Lyons Mill bridge across Rock Creek in Washington, D. C., has all the graceful beauty of an old timber bridge, even to the hand-railing, yet it is constructed throughout of concrete. The engineers of the Office of Public Buildings and Public Parks combined the durability of concrete with a cleverly conceived design that is in harmony with the sylvan setting of the bridge. This combination of appropriate architectural design with a maintenance-free type of construction is always desirable, but particularly so when first cost must be last cost, if the reduced funds available for park work are to provide required improvements.

The bridge is intended for the use of pedestrians and horseback riders, though it is amply strong to safely carry heavier traffic if required. In designing the structure, advantage was taken of three existing stone piers that have stood at the site of the bridge for many years. Their location suggested the use of a continuous deck girder construction in which the center span of 61 feet 6 inches is flanked by spans 24 feet and 26 feet long. In this way it was possible to develop very slender proportions in the girders, reducing the burdensome dead load at the center of the middle span and concentrating the material over the supports, where it acts most efficiently. The total depth of the girders from the top of the deck slab is but 2 feet 3 inches at the center, and 4 feet 3 inches at the inner piers. This type of design makes economic use of the materials in the structure.

LYONS MILL BRIDGE, OVER ROCK CREEK, WASHINGTON, D. C.

The hand-railing, which especially gives the impression of timber construction, is made of precast posts and rails. The posts are supported by hidden bosses or lugs cast integrally with the posts and fitting into notches left in the deck, and are secured in position by heavy steel straps bolted to concrete brackets. The rails are mortised into the posts and bolted to them in the fashion of old timber railings.

There are many locations in parks throughout the country where small bridges similar to the Lyons Mill bridge would add to the attractiveness of the surroundings and to the convenience of citizens. Park bridges in many places are weakened by age and require considerable sums to be spent upon them for maintenance. The replacement of these structures with modern, durable construction is an economic measure worthy of consideration by park boards. Genuine unemployment relief is afforded, too, by using relief funds for such work rather than direct doles.

Looking beyond practical and utilitarian considerations, further and more potent reasons exist for the building of bridges of a permanent type in public parks. Bridges made of wood, even of the best of wood, have to be replaced periodically, and at each replacement may become the whim of another set of designers. This makes for an ever-changing appearance of the parks, and affords no medium for the perpetuation of park traditions and historical associations. Permanent bridges, if intelligently designed, are a bond of association with the park from one generation to another, and establish the historical continuity which usually is lacking in American parks where too many structures have been of an ephemeral character. For historical reasons, if for no others, the year during which a bridge or any permanent park structure is built should be ineffaceably cut or cast on it in some clearly visible place.

JOHN L. NAGLE.

Recent City Manager Appointments

WILLIAM V. ANDERSON, Chief Examiner of the City Civil Service Commission in Glendale, Calif., became City Manager of that city on November 2. L. D. White resigned as President of the Council of Alhambra, Calif., on October 17, to accept the city managership. Fred W. Nighbert is City Manager of Bakersfield, Calif.

C. L. Bewsey became City Manager of Winter Haven, Fla., on December 1; Robert M. Kerr, City Manager of Fort Laud-Smith recently became City Manager of Smith, recently became City Manager of Fort Meade, Fla.; and M. S. Worland, City Manager of Hollywood, Fla.

Marshall Morton was recently appointed City Manager of Columbus, Ga.

William C. Kendrick, of Brookline, Mass., was appointed City Manager of Norwood, Mass., on November 13.

R. L. Van Nocker, City Engineer of Albert Lea, Minn., became City Manager on December 1.

E. C. Alexander will become City Manager of Elizabethton, Tenn., on January 15.

J. Henry Valiquette has been appointed City Manager of La Tuque, Quebec.

CLARENCE E. RIDLEY,
Executive Director, The International City Managers' Association.

For Directories of City Managers, Mayors, City Engineers, Water-Works Superintendents, Street Superintendents, see The Municipal Index for 1933.

The New TVA Town of Norris, Tennessee

By EARLE S. DRAPER
Director of Land Planning and Housing, Tennessee Valley Authority

INSTEAD of providing merely temporary housing for the 2,000 or more workers during the construction period at Norris Dam, the Tennessee Valley Authority has decided to build a permanent town which will provide for future contemplated developments in the region. Further, the plans prepared for this new town of Norris contemplate the establishment of a community based upon the orderly combination of industrial work and subsistence farming.

In this the TVA is following the growing sentiment which favors the coordination of farm and factory in the productive lives of workers throughout the nation. The Authority also recognizes that this combination of work fits not only the present tendencies of the local people, but also looks forward to the full expansion of the resources and opportunities to be developed in the Valley.

The site chosen for the permanent housing community covers an approximate area of 2,500 acres, the center lying four miles, by way of road, from Norris Dam. It occupies a high, rugged plateau stretching between the Clinch River and Buffalo Creek Valleys. Owing to conditions, both natural and imposed, the size of the town of Norris will be deliberately limited, and the great majority of the houses will be individual or single-family homes. These may be supplemented by several apartment houses of moderate size, and a boarding-house for single workers. There is no apparent need or justification for anticipating the growth of a large commercial or trading center at this point, either immediately or in the future.

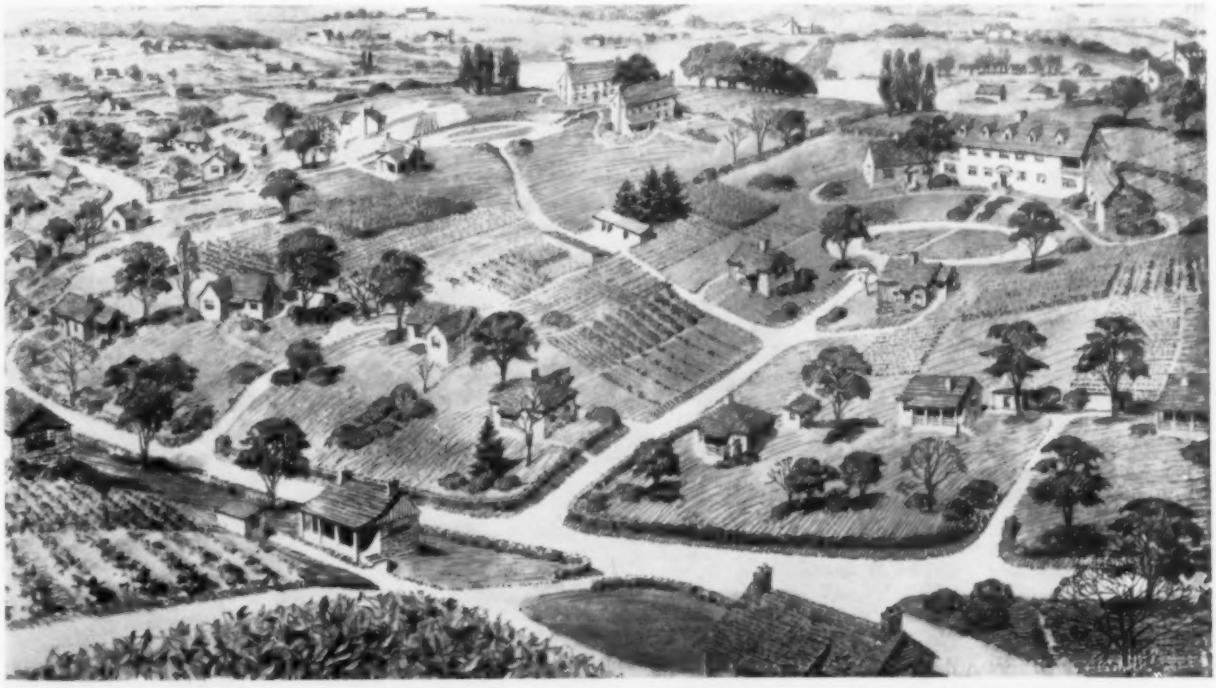
"Freeway" and Protective Zone

One of the major features of the regional development plan for the Valley will be a new, improved road using the top of Norris Dam in crossing the Clinch River. This road—technically a "freeway"—will skirt the new community and connect at either end with important existing highways now leading into the region from various sections of the country. This freeway will offer a new route between Cincinnati and the Midwest, and Knoxville, the Great Smoky Mountains and the South. Also, it will be the shortest connection around the 75-mile-long twin lakes to be formed by Norris Dam. This scenic freeway will no doubt become a popular route among tourists, and it will be fully and perpetually protected against the encroachment of signboards, hot-dog stands, shacks and all the other roadside clutter so destructive to the natural beauty of any section.

A constant threat to the maintenance of decent standards of building and land use in the vicinity of towns both large and small is the uncontrolled growth around the outskirts. At Norris, however, this evil has been successfully obviated by surrounding the entire development with a protective zone. To a great extent this consists of steep declivities along river and creek valleys. In addition, this protective belt contains some 2,000 acres of ground, most of which will serve a double purpose; that is, it will also provide space for the subsistence farms. More or less woodland is scattered here and there along the protective zone, but the extensive open spaces have good soil and drainage conditions, making them suitable for productive cultivation. The 250-foot right-of-way of the freeway also encircles a large portion of the town site, and adds its protection to the other barriers against outside influences detrimental to the continuing unity of the town.

Lot Sizes and Grouping of Houses

In Norris, home-building lots will average about 75 by 200 feet in size, giving an area of about one-third acre in each case. This proportionately narrow



The air sketch indicates the decidedly rolling character of the site of the new town of Norris. Ground contours largely predetermine the location of streets, which are often of the dead-end type to prevent through traffic. The lots are irregular, and the grouping of houses informal. The home-gardens shown here are to supplement the subsistence farms on the outskirts

frontage tends to reduce the cost of such public improvements as roadways, sewer and water mains, and street lighting; while the unusual depth provides more private usable yard space for gardening and other outdoor uses and activities. In addition, subsistence farm plots, averaging about four acres each, will be located within easy access of all dwellers in the town who desire to carry on small-scale farming in connection with their other work.

The natural ruggedness and heavily wooded nature of the site will, from the start, reduce, if not entirely obviate, any feeling of rawness in the buildings and surroundings of the new town. The roadways will be molded into the natural contours of the ground, sweeping into broad curves and resulting in irregular shaped plots of ground, thus imposing a consequent informal but related grouping of the houses. Cul-de-sac or dead-end streets are introduced wherever practicable, to prevent through traffic on residential streets. In placing the houses on the lots, careful consideration will be given to the areas to be devoted to use as lawns, ornamental planting and flower plots on one hand, and vegetable gardens and orchards on the other.

Instead of an expensive sidewalk system, improved paths, independent of roadways in most cases, will lead through the residential blocks, enabling one to reach any desired destination quickly and safely.

The Future Community

Following the completion of Norris Dam, the community will serve adequately to house the permanent forces employed in the operation of the dam and its adjuncts, in reforestation and erosion control, and those in charge of the management of the adjacent TVA properties. Also, within limitations, this community will serve the workers engaged in the various small industries and craft-shops which are expected to be one outgrowth of the TVA work-school system of guiding the native people into forming, not merely a narrow-lived, self-sufficient group of individuals, but a body of highly skilled workers contributing their full share, and even more, to our national unity and well-being.

To serve the entire community, a complete town center has been laid out adjacent to a 14-acre public recreation ground or park. Here will be grouped the public hall and administration building, a small hotel, stores, public market, bus station and service garage and other community features as the need arises. Centered on the main axis of this group will be the public school, away from traffic, yet so located that a designated section of the park may be used as a school playground. On a low ridge, somewhat isolated but easily accessible, is the hospital location. Small neighborhood parks and playgrounds are also provided for, and a well-equipped demonstration farm.

A complete water-supply and sewer system, including a modern sewage-disposal plant, will be installed. The utilities, including electric distribution station and steam laundry, are relegated to nearby but unobtrusive locations.

In none of its aspects is this to be considered a "model" town development. A thoughtful and conscientious effort has been made here to smooth out and eliminate, where practicable and without wasting money on frills, some of the crudeness and haphazard developments of the typical small town. But the local conditions met with are in many ways unique, and there is no inclination to set forth this new community as a model for all new towns and housing developments. It will, however, demonstrate that the unduly congested, insanitary, matter-of-fact ugliness and the usual haphazard growth of a small rural community, can be avoided inexpensively.

Associated in this work under the Division of Land Planning and Housing are Tracy B. Augur, head of the sections of Regional and Town Planning; formerly town planning consultant for Dearborn, Mich., and other Mid-Western cities, and for the Housing Division of the Public Works Administration; J. C. Bradner, Jr., head of the Section of Engineering, formerly Chief Engineer of the Taconic, N. Y., State Park System; R. A. Wank, head of the Section of Architecture, formerly Chief Architect for leading eastern architectural firms.

Important though it is, this housing development of the TVA is but one phase of that vast system of regional planning in the Tennessee Valley which is destined to bridge a social and economic gap of almost a hundred years.

Detroit Public Housing First to Win PWA Consideration

THE first slum clearance project to be considered by the newly created Federal Emergency Housing Corporation is in Detroit. Between $3,000,000 and $4,000,000 could be spent on the Detroit project, which would serve as a demonstration of what the Federal Government can do in low-cost housing.

The project is designed to eliminate uneconomic and unsocial conditions in a crowded area close to the downtown district now occupied in large part by Negroes. Care has been exercised in the planning not to overcrowd the development, with the result that the project will house approximately the number of persons now inhabiting the district.

The project will provide 2,900 rooms which will be rented for about $6.30 per room. Amortization will be spread over 35 years, with the Government benefiting from the revenues until reimbursed for its expenditures.

Building plans call for small building blocks formed into hollow rectangles or quadrangles producing a group unit conducive to neighborliness. There will be an average of 28 dwellings to each quadrangle, of which four will be in two-family flats and twenty in single-family two-story group houses. The initial construction program contemplates the razing of existing buildings and erection of new structures covering ten or twelve city blocks. In addition to living quarters there will be certain recreational and commercial accessories.

The Common Council of Detroit has requested the Governor of Michigan to ask the Legislature to enact a bill enabling the city to set up a housing commission with authority to take over the project, which would be financed by means of a PWA loan and grant.

TYPE OF PUBLIC HOUSING PROPOSED BY DETROIT CITY PLAN

TRAFFIC CONTROL AND FACILITATION

Conducted by Publications Committee, Institute of Traffic Engineers, 175 Fifth Ave., New York

Maxwell Halsey, Chairman, Harry Hemmings, Reyburn Hoffman, Benoit Laberge, Theodore T. McCroskey, Donald M. McNeil, A. J. Naquin, Hawley S. Simpson, Arthur G. Straetz, Peter J. Stupka, Lawrence S. Tuttle, John C. Wrighton

The Treatment of Complaints and Requests Received by a Traffic Engineering Office

By T. E. TRANSEAU

Traffic Signal Engineer, Department of Public Safety, Philadelphia

SHORTLY after the establishment of the Office of Traffic Engineering in Philadelphia in 1930, it became apparent that an organization must be built up to handle complaints. Starting with one man, who, of course, was swamped by the complaints received, averaging approximately 1,500 per year, the Complaint Division was expanded until it now numbers four full-time workers and requires the greater portion of the time of the Traffic Signal Engineer in supervision. It may be of interest to set forth briefly the personnel and their duties.

A traffic investigator, with an automobile, spends practically all his time in the field. Each morning he reports to the Office and is assigned the day's work, the work being routed in advance. The man immediately in charge of the work, or his assistant, receives the complaints, records them and makes the routing and assignments for the field man. In addition, he interviews complainants, makes sketches of the work to be done, together with his recommendations, and has various other duties. Another man handles the accident records and, from time to time as required, furnishes information concerning various intersections. This arrangement is the most satisfactory yet developed.

The following indicates the distribution, by types, of the complaints received by the Traffic Engineering Office to date, and will give a fair picture of our most pressing problems:

Slightly less than 50 per cent concern intersections.

About 22 per cent refer to congestion, leading to requests for loading zones.

The rest are miscellaneous, principally posting of streets, speeding, school signs, signal timing, congestion (not at intersections), reckless driving practices, etc.

Every effort is made to make an early acknowledgment of every complaint received, either by calling on the complainant by person, by telephone call, or in writing. Even though it may not be possible to take care of the complaint in the manner desired, a prompt, courteous reply has been found to create good feeling and a better understanding of the situation.

Intersection Complaints

The principal information to be obtained in the field investigation made by the Office following an intersection complaint is here listed:

Measurement of street widths
Trolley or bus routes
Speeds
Grades
Curb radii
Intersection angles
Lighting
Existing city structures
Trees, shrubbery, etc.
Existing poles—lighting, etc.
Location and nature of equipment nearby
Character of development
Pedestrian movement (schools, business centers, etc.)
Short traffic count (if no regular count available)
Special information when required

The investigator is instructed to visit the complainant in ordinary cases, in order that his viewpoint may be brought out at the location. In many cases, residents of the neighborhood, police officers on duty, gas station attendants and others are interviewed and their views obtained.

On the completion of the field inspection, the material is turned over to the Division of Investigation. Here there are available street and paving maps, signal location maps, and various aids toward forming an opinion as to the course recommended by the investigators. In addition, data on the amount of traffic, turning movements, hourly distribution of traffic and similar matters may be found. If necessary, a count may be made at the location.

Likewise, police accident records are at hand, showing such information as the number of accidents, time, date, direction and type. If pedestrians are involved, the age, sex and other matters of interest are brought out. Also in many cases, other conditions in connection with an accident are of interest. From the above factors, a recommendation is framed.

Loading Zone Requests

In Philadelphia, the method of establishing a loading zone is by the issuance of two stanchion signs bearing the legend, "No Parking, Load and Unload only, Ordinance of Council." These signs are, of course, for the purpose of keeping the fronts of various properties clear.

Inquiries and observations are made as to the amount of business or need for such a zone, together with other loading demands in the vicinity. If there are any other signs existing, indicating parking restrictions, suitable sketches are made. If necessary, a complete study is made of the amount and duration of parking in the street.

One of our most prolific sources of trouble is driveway conditions. Under the Pennsylvania law, parking is forbidden in front of driveways. Although many signs were issued for driveways prior to the establishment of this office, the view has been consistently taken that the remedy here lies with the affected party and that summonses should be issued. It would seem, in any case, that curb painting or roadway marking is much more effective than signs.

Disposal of Complaints

Naturally, the first consideration in making a recommendation is its necessity. Will it reduce the accident hazard and expedite traffic? Likewise, will the carrying-out of the recommendation have a beneficial effect on an adjacent intersection?

Many times the recommendations are influenced by the funds at hand. To be specific, if no funds are available for signal installation, some other expedient may serve for a time at least. If the condition is urgent, a special effort is made to get the work done, sometimes by transfer of equipment from some other location. At times, some condition peculiar to the locality may lead to some special recommendation. Each problem must be handled on its merits, and careful consideration given to the pros and cons. With this is intertwined the question of expediency. It should be apparent from the above that there is plenty of opportunity in a Traffic Engineer's Office for an orderly and tactful handling of complaints.

Abstracted from a paper presented before the Fourth Annual Meeting of the Institute of Traffic Engineers, Chicago, Ill., October 4, 1933.

Yale Establishes Bureau for Analysis of Highway Traffic and Transportation

The creation at Yale University of a new bureau for the study and analysis of highway traffic and transportation, with Professor Robbins B. Stoeckel, former Commissioner of Motor Vehicles for Connecticut, as Director, was announced November 18 by President James Rowland Angell. It will be operated as a unit under the Committee on Transportation, offering service to industry, private organizations and the public.

The Pedestrian and Our Highways

UP to the present time the protection of the pedestrian seems to have been considered of secondary importance to the regulation and control of vehicular traffic. Considerable progress has been made in the improvement of road surfaces, establishment of directional and grade separations, reduction in street grades and the elimination of dangerous curves. All this has tended to permit increased vehicle speed and doubtless has been partially responsible for the appalling loss of human life, especially in rural areas where the lack of sidewalks between suburban communities forces the pedestrian to walk on the highway with the fast-moving vehicle traffic. Thus, attempts to correct one evil have automatically intensified another. The seriousness of this problem justifies a carefully planned cooperative action against this grave menace.

PROCEDURE RECOMMENDED

In order that a comprehensive program may be initiated, the writer suggests the following plan as a simplified and economical procedure:

1. Adopt uniform laws in each state for a standardized method of road markings and signs.
2. Prohibit the use of safety signs or safety devices for advertising roadside stands, amusement places and other non-essential purposes.
3. Standardize traffic signal types for use in cities, towns and rural or suburban communities providing minimum delay to vehicle traffic.
4. Make yearly traffic surveys and carefully analyze the results and eliminate obsolete devices and unnecessary signs.
5. Install pedestrian push-button operated traffic signals, except where pretimed signals with pedestrian periods are to operate as a part of a progressive signal system.
6. Incorporate in inter-city or town highway design a sidewalk or a raised smooth shoulder, on one or both sides, where pedestrians can walk in safety.
7. Where highways exceed 50 feet in width, provide directional separation, or, if this cannot be provided, install pedestrian islands.
8. Where pedestrian islands are established on highways whereon street-railway tracks are in use, vehicular traffic in a given direction should be permitted to travel on each side of pedestrian islands.
9. Safety island bases should be adequately illuminated.
10. Where a continuous vehicular flow is important, a pedestrian under- or overpass should be provided.
11. Between suburban communities where a sidewalk or traffic signal cannot be justified, laws should be enacted requiring pedestrians to wear a shoulder type of reflector button and walk against traffic or, as in the state of Delaware, to carry some kind of light at night on all hard-surfaced highways.

Submitted by GILBERT ROBINSON,
Boston, Mass.

More Grade Crossing Elimination Advocated

To the Editor of THE AMERICAN CITY:

The fact that few state highway engineers mention grade-crossing eliminations in the interesting summary in your October and November issues of the use of Federal highway funds for improvement of traffic conditions within cities, leads me to call attention to a point of view recently expressed by the Board of Directors of the Chamber of Commerce of the United States; namely, that there is an opportunity to provide quickly, socially and economically valuable and widely distributed work through earmarking a substantial part of the public works fund for railway and other grade-crossing eliminations *to be done entirely from Federal funds.*

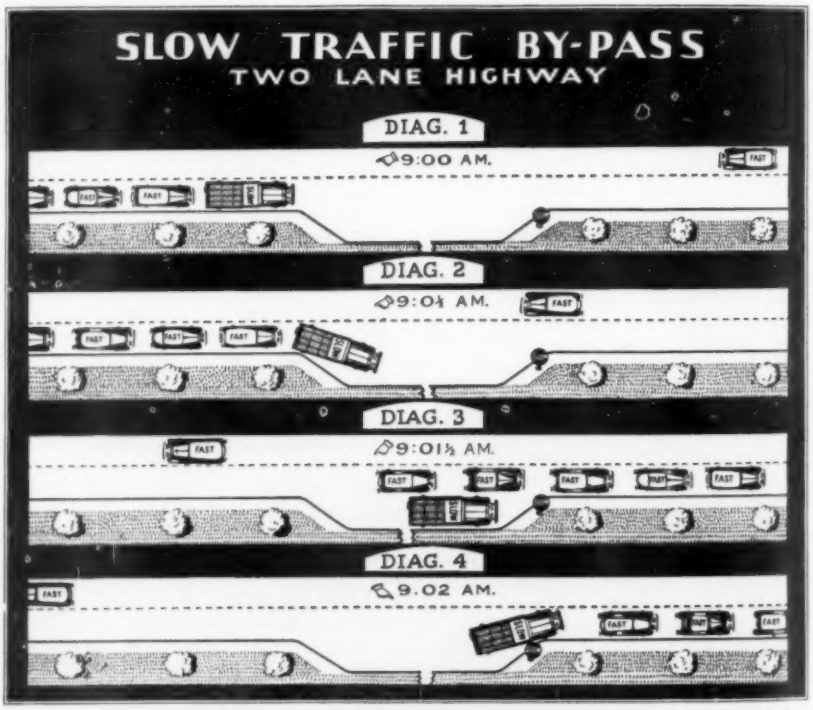
Grade crossings are widely scattered throughout the country. Their removal would provide employment near the homes of the workers. Partial and in many cases completed plans for hundreds of these projects are now available in state or local highway engineers' offices and in engineer offices of railroads. Organizations for administering this program already exist in the United States Bureau of Public Roads and the state highway departments. The work could be completely planned and brought to the point of letting contracts within sixty to ninety days. It is a type of work which can be carried on during winter months.

Construction of overpasses or underpasses does not involve any excessive additional maintenance costs for these short stretches of highways, but in many cases probably will reduce these maintenance costs by eliminating the need for protecting the crossing. The volume of work which could be initiated through such projects is flexible, both from the point of view of its location near cities where it is most needed, and of its size, being limited for all practical purposes simply by the funds available to finance it.

The same considerations hold for dangenerous narrow bridges and other traffic hazards.

F. STUART FITZPATRICK,
Manager, Civic Development Department, Chamber of Commerce of the United States.

To Facilitate Traffic on Two-Lane Highways



This plan for increasing the safety and traffic capacity of two-lane highways is suggested by A. W. Robertson, Chairman of the Board of Westinghouse Electric & Manufacturing Co.:

Every few miles a short spur roadway along two-lane highways would enable slow-moving vehicles to travel to the right of the highway a distance sufficient to permit fast traffic behind them to pass. The working of such a spur, or additional short roadway, is shown on the diagram above.

"Such an arrangement," Mr. Robertson believes, "would greatly increase travel on a two-lane highway. It would add a tremendous factor of safety by eliminating the necessity of fast traffic passing slow vehicles on the opposite right of way. These additional spurs on two-lane roadways would produce traffic facilities almost equal to those of a four-lane roadway."

National Association of Housing Officials Organized

THE National Association of Housing Officials was organized in Chicago on Nov. 25, at a meeting at International House, attended by Federal, state and municipal housing officers. Headquarters will be in Chicago.

Ernest J. Bohn, Chairman of the Housing Committee of the Cleveland City Council, was elected President of the new organization; Alfred K. Stern, of Chicago, Chairman, Illinois Housing Commission, Vice-President. Other members of the Executive Committee are George Gove, Secretary, New York State Board of Housing; B. E. Giesecke, of Austin, member, Texas Relief Commission; Edmund H. Hoben, in charge of housing, Board of Public Land Commissioners, Milwaukee. Charles S. Ascher, Secretary, Public Administration Clearing House, Chicago, was named Acting Secretary and Coleman Woodbury, Secretary, Illinois State Housing Board, Treasurer.

Charter membership of the organization, as announced by Mr. Bohn, includes Secretary of the Interior Harold L. Ickes, President of the newly organized Federal Emergency Housing Corporation; Robert D. Kohn, Director of Housing; P.W.A.; M. L. Wilson, Director, Subsistence Homesteads Division, PWA. Members of state housing boards of Ohio, Massachusetts, New York, Texas, South Carolina, Delaware, and Illinois are included in the list of charter members. Housing officials of the three cities that now have public housing projects under development—Cleveland, Toledo, Milwaukee—are enrolled.

The purpose of the organization, as outlined in the constitution adopted, is to serve governmental officials engaged in housing under public auspices, to act as an information clearing house, and aid in general in the supervision and operation of low-cost housing, rural and urban. While active membership will be limited strictly to public officials, all others interested in housing and slum clearance are invited to become associate members and to make use of facilities that the new clearing house will provide.

Additional Data on Municipally Owned Generating Plants

SINCE publication in the 1933 MUNICIPAL INDEX of the list of municipally owned generating plants compiled by Paul Jerome Raver from the records of the Institute for Economic Research, the list has been checked by the *Journal of Land and Public Utility Economics* with a list compiled by Edna C. Macmahan, of Columbia University, and appearing in her monograph, "Municipal Electric Plant Managers," published by the Public Administration Service, Chicago, Ill.

As a result, the *Journal* has published in its November number the additions and corrections here reproduced. The *Journal* explains that:

"Some of these new data are in the nature of additions to that list, and others constitute certain changes in the list as published. Since this new information is of a later date (October, 1933), it may represent changes which have taken place since December 31, 1932, and where such is definitely known to be the case it has been so indicated."

I

The following instances should be added to the list of municipally owned generating plants as published in the August *Journal:*

Arkansas: Piggott—generating all output (information conflicting).

Connecticut: East Norwalk—generating part and purchasing part. (This is the Third Taxing District of Norwalk; and South Norwalk in the original list constitutes the Second Taxing District of Norwalk.)

Delaware: Clayton—began as a purchasing establishment in 1932 and is now generating part and purchasing part of output.

Indiana: Goshen—originated in 1889, using a steam engine, began to purchase all its output in 1927, and is now generating all its output.

Iowa: Ellsworth—generating for street lighting only with an oil engine; Grand Junction—generating all since 1933 and the community is also served by a private company.

Kansas: Glasco—data incomplete; Hill City—generating all.

Louisiana: Morgan City—began as a purchasing establishment in 1931 and is now generating all.

Michigan: Allegan—generating all; Detour—generating all.

Minnesota: Delano—originated in 1903 as a steam plant, began to purchase all of output in 1915, and has again reverted to generating all output; Hawley—began with a gas engine generating plant in 1908, changed to purchasing all output in 1922, and is again generating all output; Kenyon—generating all since 1931 (700 h. p. Diesel engine); La Seuer—generating all; Moose Lake—generating all since 1931 (350 h. p. Diesel engine).

Nebraska: Sutherland—originated as a generating establishment in 1917 with an oil engine, changed to purchasing all output in 1924, and is now generating all.

North Carolina: Aurora—generating part and purchasing part.

Oklahoma: Walters—changed from private to municipal ownership in 1910 using a steam engine; in 1924 it began purchasing all its output, and has now reverted to generating all.

Oregon: Milton—began as a purchasing establishment in 1891 and changed to generating all in 1905, using hydro and oil engines.

Pennsylvania: Hatfield—began as a purchasing establishment in 1908 but has changed (probably about 1930) to generating all.

South Dakota: Burke—began in 1908 as a generating plant with an oil engine, changed to purchasing all output in 1929, and is again generating all output; Harrisburg—originated as a purchasing establishment in 1920 but has now (probably about 1930) changed to generating all its output; Valley Springs—began in 1917 as a generating plant with an oil engine, changed to purchasing all output in 1920, and is again generating all output; Worthing—originated as a purchasing establishment in 1920 but has now (probably about 1930) changed to generating all its output.

Utah: Charleston—originated as a purchasing establishment in 1931 and now generates for street lighting only.

Wisconsin: Cashton—changed from private to municipal ownership in 1909 and used a steam engine, in 1924 it began to purchase all its output, but in 1933 started to generate again with an oil engine; Kewaunee—started as a generating plant with a steam engine in 1908 and began to purchase all its output in 1923 but has been generating all output again since 1931, using an oil engine; New Lisbon—originated as a generating plant with a gas engine in 1912 and started to purchase all output in 1921, but has been generating all output again since 1931, using an oil engine.

II

The following instances should be removed from the list of municipally owned generating plants as published in the August *Journal:*

Arizona: Tombstone—information conflicting.

Colorado: Peetz—changed to private ownership; Arriba—changed to private ownership in 1933 (not on original list).

Florida: Quincy—changed to private ownership in 1933.

Georgia: Adel—purchasing all output.

Illinois: Walshville—changed to private ownership in 1930.

Kansas: Montezuma—purchasing all output (information conflicting).

Massachusetts: Boston.

Michigan: Grand Marais; Negaunee—purchasing all output; Newberry—purchasing all output; St. Joseph.

Minnesota: Fosston—changed to private ownership; Goodrich; Granite Falls—purchasing all output; Lake City—purchasing all output; Leonard; Section Thirty; St. Vincent.

Missouri: Hayti; Liberal.

New York: Arcade—changed to private ownership in 1933.

North Carolina: Pine Tops—purchasing all output.

Oklahoma: Edmond—purchasing all output.

South Carolina: Abbeville—purchasing all output; Bennettsville—purchasing all output.

Virginia: Front Royal—purchasing all output.

Wyoming: Gillette—purchasing all output.

III

In the following instances subsequent information has indicated a somewhat different technical character of the generating plants than stated on the original list as it appeared in the August *Journal:*

California: Pasadena—generating all output.

Colorado: Longmont—generating all output.

Illinois: Newton—generating all output; Sullivan—generating all output.

Indiana: New Castle—does not generate exclusively for street lighting; Peru—generating all output.

Iowa: Alta—generating all output; Fort Dodge—generates for street lighting only; Independence—generating all output; Strawberry Point—generating all output; Stuart—generating all output with an oil engine; Tipton and West Liberty have generating plants for stand-by service only.

Kansas: Burlingame—generating all output; Sterling—generating all output; Wamego—generating all output.

Kentucky: Corbin—generating all output.

Maryland: Hagerstown—generating all output.

Massachusetts: Braintree—generating all output; Hudson—generating all output; Taunton—generating all output.

Michigan: Crystal Falls—generating part and purchasing part; L'Anse—generating part and purchasing part; Marquette—generating part and purchasing part; Paw Paw—generating part and purchasing part; Wyandotte—generating part and purchasing part.

Minnesota: Alexandria—generating all output; Hibbing—generating all output; Tyler—generating all output.

Missouri: Monroe City—generating all output.

Nebraska: West Point—generating all output.

North Carolina: Benson—generating all output; Tarboro—generating all output.

Ohio: Bryan—generating all output; Hamilton—generating all output; Martin's Ferry—generating all output; Nelsonville—generating all output; Troy—generating all output; Waterville—generating all; Wellston—generating all output.

Oklahoma: Pawhuska—generating all output.

Oregon: Eugene—generating all output.

Pennsylvania: Schuylkill Haven—generating all output; Sharpsburg—generating all output.

Utah: Logan—generating all output.

Vermont: Morrisville—generating all output.

Washington: Tacoma—generating all output.

Wisconsin: Lake Mills—changed from municipal to private ownership in 1911 with a steam engine plant and later began to purchase all output but has been generating all its output again since 1931 with an oil engine.

Wyoming: Dixon—leased its plant to a private company.

Recent News from the Public Works Administration

(See also pages 5, 45, 49, 67, 68, and 73 of this issue)

More Than $3,000,000,000 Non-Federal PWA Applications Pending

PRACTICAL certainty of the appropriation by next month's session of Congress of another large sum for grants and loans for local public works is apparent from the survey of non-Federal applications pending before PWA as released on November 26. This survey shows that in the aggregate such applications would involve an expenditure of $3,160,353,717, or more than seven times the amount of money remaining unallotted in the Public Works fund.

The figures as announced by Administrator Harold L. Ickes show that there were pending at the time of the survey 4,661 non-Federal applications regarded as worthy of consideration. New applications constantly are being filed, so that the total will grow rather than diminish. Several hundred applications which on their face could not qualify under the law were not included in the survey.

Of the total number of applications surveyed, 1,821 calling for an outlay of $1,618,598,453 were pending in the Washington offices of PWA. There were pending in the field 2,840 applications requesting allotments amounting to $1,541,755,264.

PWA officials pointed out that the survey indicates an increasing popularity of PWA loans and grants as a means of combating unemployment. Public bodies which a few months ago held back are now rushing forward to press their applications.

With all but about $450,000,000 of the original $3,300,000,000 exhausted as result of the expedition with which PWA has made allotments, the Administration (until a new appropriation is made by Congress) is faced with the task of spreading remaining funds equitably among the applicants in an evening-up program.

Winter Construction to Be Pushed to the Limit by PWA

THE Public Works Administration has started a determined drive to push winter construction to the limit. To this end, orders have been sent to all PWA State Engineers, Advisory Boards and Regional Advisors instructing them to impress upon state, municipal and county officials the extreme necessity of continuing work on projects under way and of starting work on new projects wherever possible. The letter of instruction pointed out that winter construction, except in the most severe climate, is entirely feasible for many types of public works and requires only the willingness of the builder to carry out the job.

"It is essential," said Administrator Ickes, commenting on his plans, "that all interested in the effort to move men from relief rolls to pay rolls engage in a practical and widespread program of winter construction. Engineers in almost every branch of the construction industry have developed methods by which winter work can be carried on. It is our intention to encourage the use of these methods where advisable on all projects involving Public Works funds.

"It is realized that in severe northern climates thare are certain types of work which cannot be continued throughout the winter because of high weather-protection costs but, in order to counteract this slump, we have provided liberally for projects that can be carried on continuously in sections where the weather is more moderate, and we intend to press for the speedy expenditure of the funds allotted for this purpose. Hundreds of men now receiving pay checks from PWA projects should not be forced on relief rolls because of a mere prejudice against winter construction."

Other PWA officials point out that methods of handling men, machinery and materials have been so perfected in recent years that most construction can go ahead during the winter season.

PWA Appoints Inspection Division and Board of Labor Review

AS a safeguard against graft, waste and slipshod work, Public Works Administrator Harold L. Ickes announced on November 20 the organization of an Inspection Division to check up on all non-Federal projects and see that every Public Works dollar is spent as intended.

William M. Steele, a civil engineer of New York City, has been appointed head of the new division. Working under Mr. Steele's direction will be a staff of state engineer inspectors. They will work in cooperation with the State Engineers and State Advisory Boards, and will have headquarters in the offices of the latter. An engineer inspector will be appointed in each state where the number and magnitude of projects justify it. In states where the appointment of a state engineer inspector would not be justified, the State Engineer will also act as engineer inspector.

Working under the direction of the state engineer inspectors will be resident engineer inspectors, assigned to supervise and check up on one or more projects. On the large jobs, a resident inspector and one or more assistant resident engineer inspectors may be necessary.

The state engineer inspectors so far appointed are: New York, Col. M. E. Gilmore; Ohio, J. B. deHamel; Virginia, K. C. Black; Illinois, C. H. Bauer; North Carolina, C. V. York; Arkansas, C. E. Wyckoff. L. H. Clark is the supervising engineer on the low-cost housing project in Euclid, Ohio, being constructed by the Euclid Housing Corporation through Federal aid.

Announcement has also been made of the appointment of a Board of Labor Review of the Federal Emergency Administration of Public Works. The Board will hear all issues arising under the operation of contracts financed from Public Works funds, and its decision will be binding upon all parties. It will be under the direction of United States Senator Robert F. Wagner, of New York, Chairman of the National Labor Board, and is composed of three members. Prof. Lindsay Rogers, of New York, who will represent the Public Works Administration, has been designated Chairman of the Board. The other members are James Wilson, of Cincinnati, representing labor, and Ernest John Russell, of St. Louis, representing contractors.

In order to expedite questions that may arise, the Board will have representatives in different sections of the country. It will hold its first meeting in Washington on December 2.

Organization Completed of the Federal Emergency Housing Corporation

ANNOUNCEMENT was made on November 19 that organization of the Federal Emergency Housing Corporation had been completed with the election of officers and the adoption of by-laws, thereby permitting the corporation to proceed with its purposes.

Officers were announced as follows:

President of the Corporation, Secretary of the Interior Harold L. Ickes
Vice-President, Secretary of Labor Frances Perkins
Treasurer, Assistant Secretary of Agriculture Rexford G. Tugwell
Secretary, Lloyd H. Landau, Solicitor of the Public Works Administration
Comptroller, George H. Parker, Chief Accountant of the Public Works Administration

The following directors were elected by the incorporators:

Secretary Ickes, Secretary Perkins, Assistant Secretary Tugwell
Robert D. Kohn, Director, Housing Division, PWA
Col. H. M. Waite, Deputy Administrator of Public Works

The objects of the Corporation, as stated in the preliminary announcement on page 5 of THE AMERICAN CITY for November, are to assist public bodies and other organizations in slum clearance and erection of low-cost housing projects and to engage directly in such activities. The Corporation's activities, however, will not interfere with projects for which PWA allotments have been made or may be made in the future.

Director Kohn, reporting on a tour last month of the Middle West and Pa-

cific Coast, during which he conferred with housing authorities and citizens' committees in ten cities, states that everywhere he found an eagerness to cooperate with the PWA and the Housing Corporation's plan to clear slum areas and build good, self-liquidating, low-cost housing. Housing authorities and civic committees are reported to be going ahead with studies of local conditions, consideration for the types of housing advisable, extent to which slum clearance projects might properly go within the next year or two, and social and economic groups to be helped in each case.

Civil Works Employees Covered by Federal Compensation

ALL civil works administration employees throughout the country are covered by workmen's compensation under the Federal compensation law, it was announced today by Harry L. Hopkins, Federal Civil Works Administrator.

Compensation for injuries suffered on civil works jobs, Mr. Hopkins said, may be given up to two-thirds of their regular weekly wage. No compensation may be paid, however, for the first three days of disability.

Types of Projects Eligible for Civil Works Funds

IN addition to the types of projects already approved by the newly created Federal Civil Works Administration for outright grants from the $400,000,000 CWA funds as listed on page 5 of this issue, many other kinds of local work will, of course, receive such aid.

In a circular letter issued on November 21 by the Department of Health of the State of New York, C. A. Holmquist, Director of the Division of Sanitation said:

"In the field of sanitation there are many desirable improvements which can be undertaken quickly and completed within the three-months period which the $400,000,000 appropriation is intended to cover. But local municipal officials should act promptly.

"Construction of diverting ditches around springs and wells, fencing of water reservoirs or supply areas, reforestation of watersheds, protection to wells and springs, construction of coagulation basins, repairs to filter plants and pumping stations, installation of auxiliary supply lines, installation of water meters, raising dams to provide increased storage, reservoir stripping, small water and sewer extensions that can be completed within three months, paint jobs to preserve metal surfaces in water or sewage treatment plants, construction of sludge beds and repairs to sewage treatment plants, grading and landscaping, construction of buildings to house chlorinators, filling over garbage dumps, and drainage of mosquito breeding places, are some of the types of projects which should be considered."

A wide variety of traffic improvement projects and surveys would also be eligible for CWA funds. For definite suggestions the reader is referred to the article by Burton W. Marsh in the 1933 Municipal Index on "Making Unemployment Relief Funds Save Lives in Traffic." Planning, housing and recreation surveys are also eligible, as indicated below.

Federal Funds for State and Local Planning

AN allotment of $250,000 to the National Planning Board to stimulate the preparation of state, regional, local and city plans was announced in November by the Public Works Administration.

The program contemplates the sending of qualified technical advisers to such existing state, city and regional planning units as meet with requirements and standards set up by the National Planning Board.

These advisers will stress the need of practical planning and will endeavor to coordinate efforts in this direction which may be made in any community. Their work will be chiefly of an educational nature.

It is contemplated also that upon the organization of new planning units throughout the country, which in the opinion of the NPB and the PWA, have the assurance of local support, one or more technical experts will be appointed to organize and direct the work.

A special allotment of $35,000 to the NPB to ascertain the extent to which planning researches and surveys are now being made throughout the country and to study and correlate these surveys has also been announced. The data to be collected will cover such subjects as natural resources, population distribution and trends, problems of health, local planning, and researches in any other field which has a direct bearing on national welfare. The sources of this material, according to the NPB, will be Federal agencies, foundations, universities, special research institutions and private sources.

CWA Funds for Planning

On November 16 Frederic A. Delano, as Chairman of the National Planning Board, sent a form letter to city, county, regional and state planning organizations throughout the United States, calling attention to the eligibility of projects for preparation of plans, surveys, studies and mapping for assistance from the funds of the newly established Civil Works Administration.* In this letter it was recommended that, as a basis for comprehensive planning, official planning agencies take *immediate action* toward the formulation of planning projects.

"These projects," Mr. Delano suggested, "might include such matters as mapping, planning studies and surveys for the collection of data for zoning, soil conditions, land use and classification, population distribution, schools, park and playground development, port, harbor and waterway work, parkways, highways, traffic, transit, water supply, drainage and sewerage, long-range financial programs, real property inventories, tax maps, building and housing conditions, subdivision control, etc."

A subsequent statement by the National Planning Board said:

"The procedure which should be followed by the local community desiring to undertake a planning project with the aid of personnel supplied through Civil Works funds is very simple. All the necessary authority for making such personnel available to a planning board or other official agency has been delegated to state and local Civil Works divisions. All a planning board has to do is submit its project or projects to the local Civil Works Division. Its application for workers should briefly describe the wrk to be done, the time it would require, the qualifications and number of technical, clerical and other personnel which will be necessary to do the work."

St. Paul Gets Speedy Action

On November 27, George H. Herrold, Managing Director of the City Planning Board, of St. Paul, Minn., was able to write to Mr. Delano as follows:

"We appreciate your circular letter of November 16 entitled 'Planning Projects and Work Relief.' We immediately made plans and specifications for the following projects and estimated costs:

Comprehensive traffic survey	$15,000
Comprehensive recreation and playground survey	8,970
Housing survey	5,820

"I am very pleased to advise you of our success. All amounts were granted by the state organization handling CWA funds. We put fifty-one people to work Saturday and will add about fifty more today. These came from the City Relief Rolls and the Federal Reemployment Service."

* See page 5 of this issue.

The Municipal Bond Market

Recent sales of new issues, from November numbers of *The Bond Buyer*:

Amount	Borrower and Purpose	Rate (%)	Term (Years)	Basis (%)
$600,000	Milwaukee Co., Wis., Corporate	4.5	1-5 (Ser.)	6.35
375,000	Maryland, Ocean City Inlet	4	8 1/3 (Avg.)	3.74
165,000	Groton, Conn., Funding	4.5	1-11 (Ser.)	4.22
100,000	Waukesha, Wis., Public Relief	4.5	1-20 (Ser.)	4.58
410,000	Schenectady, N. Y., Municipal Congrounds survey 8,970	4.75	5 2/5 (Avg.)	4.71
300,000	Hoboken, N. J., Funding	5	2-16 (Ser.)	5
848,000	Montgomery Co., Ohio, Refunding	6	8 1/6 (Avg.)	6

Prepared by
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Author of "The Law of City Planning and Zoning"

ZONING and PLANNING NOTES

From Data collected by the Zoning Committee of New York (233 Broadway)

Eminent Domain—Building Line

MASSACHUSETTS.—*Grove Hall Savings Bank v. Town of Dedham* (Supreme Court, September 19, 1933), 187 N. E. 182.—A building line, under Gen. Laws, Ch. 82, Sec. 37, is an encumbrance upon the land in the nature of an equitable easement for the benefit of the public. It is a taking of private property by eminent domain.

EDITOR'S NOTE.—There are many lines established by public authority which, in a general way, may be described as building or setback lines, as the case may be. These lines differ in their nature. In some cases they are held to involve a taking of private property for which compensation must be paid; in others they are established under the police power, no property right is deemed, constitutionally, to be taken, and no compensation need be paid. An enumeration of some of these lines may be of interest.

Wherever a street line is established, it is the line in front of which the property owner has no legal right to build, although in some cases the public authorities may give him a revocable license to "encroach" upon the public property beyond.

Street lines may be laid down in various ways. Such lines may be created by merely placing the line on a map, by virtue of a statute to that effect. In this case, as yet, there is no taking of property, and no compensation need be paid. These lines cannot be created in this way in all cases; the action must, under all the circumstances of the case, be reasonable.

Later, the public authorities, wishing actually to construct the street, may condemn the property for that purpose, paying for it. This is, obviously, the laying down of a line somewhat different in character.

Lines, sometimes called building or setback lines, back of the street line, may be fixed by zoning. In such cases the action is under the police power and must be reasonable under all the circumstances. No compensation is paid. Such lines are more accurately described as front, side and rear courtyard lines, to provide light and air.

Lastly, there is the building or setback line described in the decision summarized above.

Non-Conforming Use—Boards of Appeals

NEW JERSEY.—*Provident Institution for Savings v. Castle* (Supreme Court, September 15, 1933), 168 Atl. 169.—A landowner is entitled to a permit to repair a building so that it can again be devoted to a non-conforming use to which it was put at the time of the passage of the zoning ordinance.

There is an immediate right of resort to the courts in mandamus to compel the building inspector to issue a permit, although there has been no appeal to the board of adjustment, where under the facts the right to the permit is clear.

Non-Conforming Use

NEW JERSEY.—*Weisman v. Shoerner, Superintendent of Buildings* (Supreme Court, August 29, 1933).—Where the tenant, without the landlord's consent, removed gasoline tanks and pumps which were on the premises when the zoning ordinance was adopted, the landlord has the right to restore the premises to their former condition.

Highways—Filling Stations—Estoppel

OKLAHOMA.—*State ex rel. King, Attorney General, v. Friar* (Supreme Court, September 26, 1933), 25 Pac. 2d, 620.—A filling station encroaching 5 feet on a state highway so that it obstructs the view of travelers is a public nuisance. The fact that other filling stations are located within the city limits which also incidentally encroach upon the public highway, constitutes no defense to this action to enjoin the station. Laches and estoppel do not operate against the state, and no procrastination of public officials prejudices the state, and their tardiness neither bars nor defeats the state from vindicating its sovereign rights except where positive statutes so provide.

Zoning Ordinance—Business District

NEW YORK.—*City of New Rochelle v. Blossom Cleaners and Dyers, Inc.*, City Court, Westchester County, reported in *Westchester County Law Journal*, October 17, 1933.—This is a prosecution for the violation of the building zone ordinance. Under it as now in effect, no premises in a business district may be used for a cleaning and dyeing establishment employing more than five persons. There are two buildings on the lot, one in the front, the other in the rear. The front building employs 15 or 20 persons and was erected prior to the passage of this ordinance. It is therefore continued as a non-conforming use. The rear building was constructed after the ordinance was passed.

In the opinion of the Court, the permit for the second building, to be used by not more than five persons, was rightly granted. Now the occupants of both buildings use the rear building. It is therefore used by more than five persons and violates the ordinance.

Non-Conforming Use

NEW YORK.—*Town of Islip v. Newton*, Supreme Court, Suffolk County, reported in *New York Law Journal*, November 10, 1933.—Prior to the adoption of the zoning ordinance the former owner of the property had erected on it a building which was fitted only for store purposes but which was not occupied for business until after the passage of the ordinance. That ordinance permitted the continuance of a non-conforming use in a residential district. The town claimed that under the circumstances there was no "use" of the building before the ordinance was passed, and that therefore it could not be occupied for business in that district after the enactment of the ordinance.

This claim the Court overruled, saying: "While it was unoccupied for such purposes until after the adoption of the ordinance, the owner of the premises had incurred expense in the erection of a building that could be utilized only for commercial use. The term 'use' in the ordinance in question is not limited to actual uses. The interpretation of the term 'use' has been stated in *People ex rel. Wohl v. Leo* 109 Misc. 448, affirmed 201 App. Div. 857 as follows:

"'The meaning of the word "use" is not confined to describing the act of using, but may also be employed to describe that property of a thing which renders it suitable for a purpose. . . . The use of a building designed and constructed for business is for business, and its use for business exists where the plan of the building is not structurally changed.'

"The ordinance is a restriction of the common law and must receive a strict construction in favor of the property owner. . . . It should not be construed in such a manner as to deprive him of all beneficial use of the property."

The Twenty Per Cent Clause in Zoning Ordinances

On our May and August, 1933, Notes, the clause in the New York City Zoning Resolution giving the owners of frontages to be changed by an amendment of the Resolution, and those opposite to and in the rear of that area, the right of protest, and a case interpreting that clause (*Matter of Schmidt v. McKee*, in the Appellate Division), were the subject of comment. This clause, as worded in the New York City Zoning Resolution, has been found to be difficult of interpretation, and has been differently worded in most other ordinances, within and without the state of New York.

An article on this clause, by Edward M. Bassett, was released to the New York City daily papers September 23, 1933, and appeared in a number of them. The occasion of the article was the passage of a local law in the Municipal Assembly of New York City, which is now in force as No. 14 for the year 1933. Since the publication of Mr. Bassett's article, another decision (*Nichols v. O'Brien, Mayor*), interpreting that clause as formerly worded, has been rendered in the Supreme Court, Kings County, which is reported in the *New York Law Journal* for October 13, 1933.

Map of Planning Commissions and Zoned Communities

As our readers know, the comprehensive program of public works under the National Industrial Recovery Act involves the formulation of a national plan to correlate that program with existing planning agencies. To this end the President has created a National Planning Board*; and that Board has prepared a map showing the location of all existing planning commissions and zoned communities. Another map is being completed to show regional planning areas. Some of the activities of the Division of Housing of the Department of Commerce have been taken over by the Board.

* For personnel, see THE AMERICAN CITY, August, 1933, page 67.

THE CITY'S LEGAL RIGHTS AND DUTIES

Conducted by A. L. H. STREET, Attorney at Law

Annexing Territory

City held not entitled to annex part of river, the area not being adapted to development, where annexation would increase a bridge company's taxes without substantial benefit to the company (Kentucky Court of Appeals: *City of Russell v. Ironton-Russell Bridge Co.*, 60 S. W. 2d, 628).

Business Regulations

Ordinance forbidding solicitors, etc., to enter private premises without invitation held constitutional (United States Circuit Court of Appeals, Tenth Circuit: *Town of Green River v. Fuller Brush Co.*, 65 Fed. 2d, 112; reversing decision (60 Fed. 2d, 613) cited at page 76, THE AMERICAN CITY, June, 1933).

Ordinance forbidding sale of milk in bottles bearing name or mark of one other than producer or distributor held invalid as barring bottles bearing only the name of the bottle manufacturer (Florida Supreme Court: *Logan v. Alfieri*, 143 So. 872).

City Attorneys

City commissioners, acting as improvement district boards, held empowered to employ and pay city attorney for legal services rendered districts (Arkansas Supreme Court: *Bourland v. Coleman*, 60 S. W. 2d, 1021).

Civil Service

Removal of policeman without reasonable time to defend against misconduct charge held not illegal in the absence of a showing of meritorious defense (New Jersey Supreme Court: *Smith v. Borough of Collingswood*, 167 Atl. 4).

War veteran held to have preference right to continue in office as assistant to Clerk despite Council's attempt to abolish position and create new one (Minnesota Supreme Court: *State v. City of Eveleth*, 249 N. W. 184).

Condemnation Proceedings

Kansas City charter held not to require payment of condemnation award before property could be taken for public use (Kansas City Court of Appeals: *Heorath v. Halpin*, 60 S. W. 2d, 744).

Contracts

City's agreement to dredge channel, etc., for private benefit of individual held void, although providing for reimbursement of city (Florida Supreme Court: *Brumby v. City of Clearwater*, 149 So. 203).

Contract to drill well for city held void because competitive bids were not invited as required by statute (Oregon Supreme Court: *Kernin v. City of Coquille*, 21 Pac. 2d, 1078).

Contract with city electrician for plans for street lighting held valid, where work was not covered by his regular salary (New Jersey Supreme Court: *Ringleben v. City of Long Branch*, 166 Atl. 470).

Municipal Auditoriums

City could rent convention hall for sporting exhibitions and other private ventures for profit, if public use was not interfered with (Pennsylvania Supreme Court: *Clarey v. City of Philadelphia*, 166 Atl. 237).

Township held not liable for injury to pipe organ of lessee of auditorium due to leaky roof (Ohio Court of Appeals, Miami County: *Partlow & Gates v. Monroe Township*, 186 N. E. 5).

Official Eligibility

One may be both mayor and justice of the peace of a city unless a statute forbids (Pennsylvania Supreme Court: *Commonwealth v. Franek*, 166 Atl. 878).

Official Removals

Bias or prejudice held not to disqualify Board of City Commissioners from hearing charge against member, he having a legal remedy against arbitrary or wrongful action of Board (Kentucky Court of Appeals: *Arbogast v. Weber*, 60 S. W. 2d, 144).

Official Salaries

Village Marshal's salary held validly reduced from $3,000 to $10 per year after election but before commencement of term (Ohio Supreme Court: *Village of South Euclid v. Bilkey*, 186 N. E. 101).

Ordinances

Ordinance prescribing no penalty for violation held insufficient to sustain criminal prosecution (Kansas Supreme Court: *City of Coffeyville v. Vakas*, 22 Pac. 2d, 428).

Safety Measures

Ordinance requiring bond to indemnify against damage caused by drilling oil wells in city upheld (United States Supreme Court: *Gant v. City of Oklahoma City*, 53 Sup. Ct. 530).

Sewers

City could require substitution of water-closets for privy vaults on sewer connections becoming possible (Missouri Supreme Court: *City of St. Louis v. Hoevel Real Estate & Building Co.*, 59 S. W. 2d, 617).

Abutting lots assessable on frontage basis for drainage facilities afforded by sewer (New Jersey Supreme Court: *Wilson v. Ocean City*, 165 Atl. 880).

Lack of immediate benefit held not to vitiate sewer assessment (Georgia Supreme Court: *Incorporated Investments, Inc., v. City of Atlanta*, 168 S. E. 10). To same effect, see *St. John v. King*, 20 Pac. 2d. 123, decided by California District Court of Appeal.

Act repealing authority to form sewer districts held valid as against district that had taken preliminary steps (Missouri Supreme Court: *State v. Wellston Sewer District*, 58 S. W. 2d, 988). But repeal does not affect assessments levied for established sewers (Indiana Supreme Court: *Wheeler v. City of Indianapolis*, 185 N. E. 125).

Sidewalks

City held entitled to revoke permission for use of sidewalks abutting upon city market for stands (Indiana Supreme Court: *House-Wives League, Inc., v. City of Indianapolis*, 185 N. E. 511).

Abutter held not entitled to damages because mud, etc., accumulated, due to sidewalk's being below street grade (Kentucky Court of Appeals: *City of Paintsville v. Preston*, 59 S. W. 2d. 542).

Street Improvements

City's liability for breaking agreement to construct retaining wall in improving street, resulting in slides, etc., onto adjacent property, held measured by the difference in value of the property with and without the wall (Kentucky Court of Appeal: *City of Harlan v. Eversole*, 58 S. W. 2d, 371).

Paving contractor's five-year guaranty held to extend to defects arising from failure of old base (Texas Court of Civil Appeals: *McElwrath v. City of McGregor*, 58 S. W. 2d, 851).

Railroad roundhouse property not assessable for non-benefiting street improvement (Alabama Supreme Court: *City of Mobile v. Mobile & Ohio Railroad Co.*, 147 So. 606).

Streets

City held empowered to permit buildings to be moved along streets (Indiana Appellate Court: *Woodsmall v. Carr Tire Co.*, 185 N. E. 163).

City held entitled to establish public market for three half-days weekly in streets abutting city property (California District Court of Appeal: *Ex parte Anderson*, 19 Pac. 2d, 1027).

Cost of street signs not payable out of street improvement bond funds (Texas Court of Civil Appeals: *Giles v. City of Houston*, 59 S. W. 2d, 208).

Tax Collecting

Mistake of Treasurer in telling purchaser of land that there were no unpaid assessments held not to estop city to claim lien (South Carolina Supreme Court: *Farrow v. City Council of Charleston*, 168 S. E. 852).

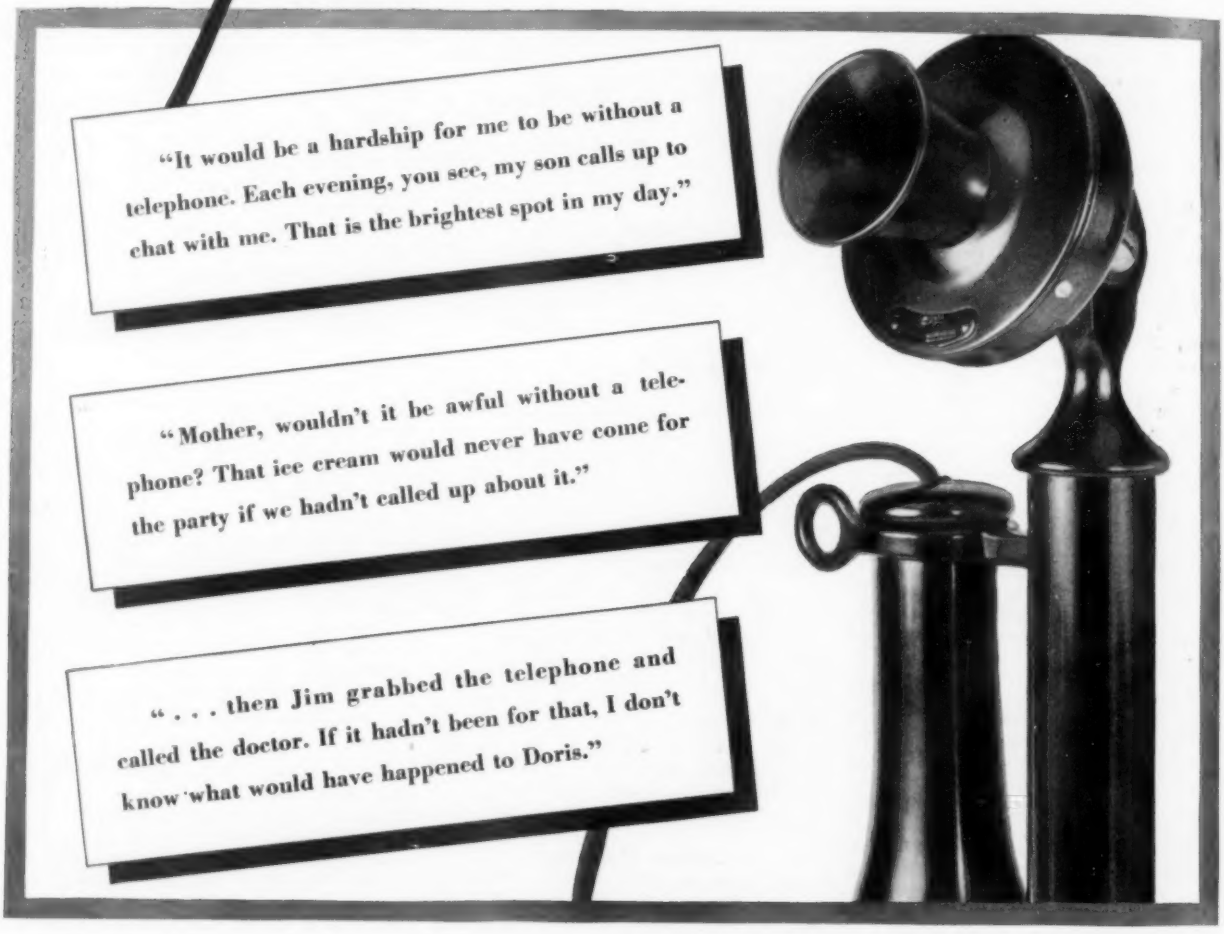
Taxpayers' Suits

Taxpayer held not entitled to mandamus concerning charter election nor attorneys' fees, but entitled to costs (Ohio Court of Appeals: *State v. Faurot*, 185 N. E. 59).

Telephone Rates

Telephone rates prescribed by city held valid (United States District Court, Western District of Texas: *Southwestern Bell Telephone Co. v. City of San Antonio*, 2 Fed. Supp. 611).

A *Friend* in the house


"It would be a hardship for me to be without a telephone. Each evening, you see, my son calls up to chat with me. That is the brightest spot in my day."
"Mother, wouldn't it be awful without a telephone? That ice cream would never have come for the party if we hadn't called up about it."
". . . then Jim grabbed the telephone and called the doctor. If it hadn't been for that, I don't know what would have happened to Doris."

THERE are many fine things in life that we take almost for granted. Health, water, sunlight, green fields, loyal friends, a home to live in. . . . Not until some mischance deprives us of these priceless possessions do we learn to esteem them at their true value.

It is in much the same manner that most people regard the telephone. Millions of men and women have never known what it is to be without one. Each day, each week, each year, they use it freely, casually, as a matter of course.

The telephone has won an important place for itself in life and living because of service rendered. To keep friend in constant touch with friend, to help manage a household smoothly and efficiently, to give larger scope and opportunity to business of every kind, to protect loved ones in time of unexpected danger . . . this is the task of the telephone.

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MUNICIPAL AND CIVIC PUBLICATIONS

Prices quoted do not include postage, unless so stated

Traffic

The Automobile Compensation Plan: A Solution for Some Problems of Court Congestion and Accident Litigation in New York State.—By Patterson H. French, LL.B., Ph.D., University Fellow, Columbia University. Columbia University Press, New York. 1933. 262 *pp.* $3.50 *from* THE AMERICAN CITY.

There is great need for relief of present congestion of civil litigation and for adjustment of payment for motor-vehicle injuries to the losses suffered by accident victims, and making such payment certain and prompt. The new plan of automobile compensation proposes a system of compensation tribunals and insurance to handle this business quickly and fairly without court litigation. Its constitutionality and practicability are discussed, and arguments for and against it are presented. Its special significance is in the suggested administrative, rather than judicial, procedure. The many problems which would grow out of such a change are analyzed.

The Committee on Traffic and Public Safety of the City Council of the City of Chicago (John A. Massen, Chairman) presented in October, 1933, "A Limited Way Plan for the Greater Chicago Traffic Area: A Physical and Fiscal Program for Limited Way Construction in the City of Chicago and in the Surrounding Region." Miller McClintock, Director of the Albert Russel Erskine Bureau, Harvard University, is the consultant. An imposing report of 103 pages, with photographs, maps, plans, and charts. The suggestions given are based on the knowledge that the problem concerns Cook County and the state of Illinois as well as the city of Chicago, and demands a coordinated program and joint action, because Chicago's traffic problem is increased by the large number of vehicles coming from and going to points outside the city. Four projects are set forth in the recommended initial program for limited way construction, all considered essential in themselves, and a natural and logical part of any ultimate system. A summary of estimated costs of these projects is given. (Apply to Chairman Massen, Chicago, Ill.)

Power Plants

A reprint has been issued by the *Journal of Land and Public Utility Economics* (337 E. Chicago Ave., Chicago, Ill.) of the list of "Municipally Owned Establishments Which Were in Existence in the United States on December 31, 1932, and Which Were Purchasing All Current Distributed on December 31, 1930," compiled by Paul Raver Jerome from the Records of the Institute for Economic Research. This appeared in the November issue of the *Journal*. It contains an appendix giving the most recent information on the list of generating plants. 8 pp. 50c. (Apply to the *Journal*.)

Municipal Government

In *The Municipality* for September-October, 1933, published by the League of Wisconsin Municipalities (114 N. Carroll St., Madison, Wis.), appears an excellent paper on "Keeping Citizens Informed About Their Municipal Government," by Richard E. Krug, Municipal Reference Librarian, Milwaukee, Wis., delivered at the League's 35th annual convention. It deals with the importance of developing the right kind of public opinion as security for local government, through attractive, short, non-technical municipal reports, definite, enlivening, original; good public relations on the part of municipal employees; non-political use of newspapers in relating city affairs; and radio broadcasting. 25c. (Apply to the League.)

Taxation

"Significant Changes in State Tax Systems"—is the first number of a mimeographed bulletin, "Taxbits," being issued by the General Welfare Tax League. It contains a brief analysis of some recent legislation and tables giving the present status of sales and income taxes in the states. Compact with valuable information. 7 pp. mimeographed. 25 cents. (Apply to the League, 309 E. 34th St., New York.)

Taxation

The Tax Racket.—By Ray E. Untereiner. J. B. Lippincott Company, Philadelphia. 1933. 162 *pp.* $1.00 *from* THE AMERICAN CITY.

Much more creditable than the gaudy title and the inaccurate jacket would indicate. The treatment of expenditures appears superficial and some of the statistics, for which, incidentally, no authority is given, would seem open to question, such, for example, as that the cost of living has dropped 40 per cent during the depression and that in 1932 taxes took 24 per cent of the national income. (Upon the basis of estimates made by the National Industrial Conference Board, the correct proportion is less than 20 per cent.) The discussion of taxation is a clear and readable statement of mainly orthodox ideas, touched up here and there by conclusions that would not be generally accepted by students of public finance. For example, the rigid separation of tax sources for different units of government is considered by many students to be much less desirable than a coordinated revenue system. There would probably also be widespread disagreement with the statement that "from the standpoint of administration it would appear logical for the states to relinquish the privilege of taxing incomes and inheritances in exchange for a monopoly of the sales tax field."

The Theory and Practice of Modern Taxation.—By William Raymond Green. Commerce Clearing House, Inc., Chicago. 1933. 266 *pp.* $2.75.

There are many books on taxation which are both scholarly and accurate. There are few that combine these virtues with those of being interesting and intelligible to laymen. Judge Green's work, which has grown out of theoretical knowledge and practical experience, combines all these qualities. He was a member of the Ways and Means Committee of the United States House of Representatives for fifteen years, and is now a member of the United States Court of Claims. As is to be expected from the author's background, the book emphasizes particularly the Federal tax structure, but several chapters are devoted to the revenue systems of other countries, and there is a brief but illuminating discussion of state tax problems. For the busy man or woman who wishes to become informed on taxes in the course of an evening's reading, this book is to be highly recommended, and the more thoroughgoing tax student will likewise find it stimulating and informative. May there be more such treatises!

MABEL L. WALKER.

Finance

An address delivered by Lloyd Morey at the annual meeting of the American Institute of Accountants, at New Orleans, October 17, 1933, on "Municipal and Governmental Accounting" has been reprinted from the November issue of *The Journal of Accountancy*. 16 pp. The discussion deals with the relation of the public accountant to governmental accounting, his opportunity in this field, and what may be done to improve the efficiency of governmental accounting, and of the professional standing of the public accountant. (Apply to *The Journal of Accountancy*, 135 Cedar St., New York.)

City and Regional Planning

The Proceedings of the fifteenth annual meeting of the Ohio State Planning Conference, held in Columbus October 19 and 20, 1933, have been issued in mimeographed form, 50 or more pages, at $1.00 a copy. Many excellent addresses and discussions on city, regional and state planning, housing and slum clearance, are included; also the report of the Legislative Committee on Proposed City Planning Legislation for Ohio, of which Alfred Bettman, President of the National Conference on City Planning, is Chairman; also discussion on state enabling acts to provide for county and regional zoning, a state park system and state planning. (Apply to Ohio State Planning Conference, 409 Hamilton County Court House, Cincinnati, Ohio.)

Public Works

The "Manual of Public Works Records and Administration, Flint, Michigan" has been issued as Publication No. 35 by the Public Administration Service, 850 E. 58th St., Chicago, Ill. 72 pp.; 50 forms; planographed. 75c. It presents the latest installation made by Messrs. Stone and Moe and their associates of the staff of the Public Administration Service and the Committee on Uniform Street and Sanitation Records, under the auspices of the Michigan Municipal League. It is intended as a model for other similar cities, and represents the latest practices in this field. (Apply to Charles S. Ascher, Director, Publications Division of the Service.)

Public Ownership

An address on "Public Ownership the Way Out" was given by Carl D. Thompson, LL.D., Secretary, Public Ownership League of America, at the meeting of the Class Room Teachers of the National Education Association, in Chicago, July 4, 1933, and contains the substance of Secretary Thompson's message to the Biennial Public Ownership Conference in Chicago, October 28, 1933. 14 pp. in *Public Ownership* for October, 1933. It sets forth the author's reasons for urging the extension of the principle of the public ownership of basic public utilities and service in order to maintain, expand and improve the public schools and the public service; to solve the problem of the unemployed; to help solve the problem of taxation; to secure safe and stable investment and security for savings; to stabilize the social and industrial order. (Apply to the League, 127 N. Dearborn St., Chicago, Ill.)

Culverts

"Construction and Performance of Reinforced Concrete Pipe Culverts," American Road Builders' Association Bulletin No. 38; 7 multigraphed pp., illustrated. "Construction and Use of Corrugated Metal Pipe Culverts," the Association's Bulletin No. 41; 80 printed pp., photographs, drawings, designs. Important highway engineering material—the latest data in convenient form. (Apply to the Association, National Press Bldg., Washington, D. C.)

Housing

"Rehabilitation of Blighted Areas Proposed in Regional Plan Report" is Information Bulletin No. 15 issued by the Regional Plan Association, Inc., 400 Madison Ave., New York, November 27, 1933. 12 quarto pp., illustrated. Contents: Blight Widespread in the Larger Cities; The Remedy—The Neighborhood Unit Principle; A New Kind of City Life; Cost and Rentals; A Practical Procedure for Conducting Rebuilding Operations; Applications to a Site in New York City. Subscription price for these bulletins, issued from time to time, $1.00 a year; they are distinct from news releases, are numbered serially, and punched for filing conveniently. (Apply to the Association.)

Purchasing

The Municipal Reference Bureau of Cincinnati, Ohio, issued last month a mimeographed memorandum of 18 pages on "Municipal Purchasing Methods and Procedure." It is the result of information received from 18 cities which responded to a questionnaire sent out to 41 cities of at least 200,000 population. The data are presented in tables. (Apply to the Bureau, 244 City Hall.)

Cemeteries

The Association of American Cemetery Superintendents has published the Proceedings of its convention held at Milwaukee, Wis., August 14-17, 1933, in a pamphlet of 143 pages. The material presented, covers, in papers and in discussion, many principles and details of cemetery management. (Apply to the Secretary-Treasurer, W. B. Jones, Superintendent, Highwood Cemetery, Pittsburgh, Pa.)

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Finance

From various issues of *The Journal of the National Education Association* in 1933 and 1934 have been reprinted and preprinted articles, grouped in a 16-page quarto pamphlet entitled "Essentials of Taxation," by Harley L. Lutz, Professor of Public Finance, Princeton University, and William G. Carr, Director, Research Division, National Education Association. Published by the Joint Commission on the Emergency in Education of the National Education Association and the Department of Superintendence, November, 1933. Containing: What Is a Tax?; What Are Taxes For?; What Is a Good Tax System?; Who Pays Taxes?; Types of Taxes—Property, Income, Sales; Efficient Tax Administration; and Getting the Facts on Taxes. 15c. (Apply to the Association, 1201 Sixteenth St., N. W., Washington, D. C.)

"Comparative Statistics, Cities of Ohio, 1932," by Jos. T. Tracy, Auditor of State, Chief Inspector and Supervisor, Bureau of Inspection and Supervision of Public Offices; and D. O. Heeter, Statistician. 116 pp. Tables. (Apply to the Bureau, Columbus, Ohio.)

A paper on this subject was presented by T. Bradshaw, F.I.A., of Toronto, Ont., before the thirty-fifth annual meeting of the Ontario Municipal Association, in Toronto, August 31, 1933. It is published in a pamphlet of 22 pages, including charts. A careful analysis of present conditions of financial administration in Canadian municipalities, and of the means by which the commendable record may be maintained. (Apply to the Association, 137 Wellington St., W. Toronto, Ont.)

"What Becomes of the Tax Dollar in Beverly Hills" is a 16-page multigraphed pamphlet compiled by B. J. Firminger, City Clerk of Beverly Hills, Calif., August 1, 1933, and edited by Gilbert Woodhill. It covers the fiscal year ending June 30, 1933. There is a statement referring to each city department. The operating cost of each department is given and worked out on a percentage basis, showing also the per family cost to the taxpayer—estimated population of 20,000, with an average of 4 persons per family. (Apply to the City Clerk.)

Social Welfare

A report on "The County as an Administrative Unit for Social Work," by Mary Ruth Colby, has been issued by the Children's Bureau, United States Department of Labor, as Bureau Publication No. 224. July 28, 1933. 48 pp. "Experience shows," says Grace Abbott, Chief of the Bureau, "that local public agencies employing a professional staff and serving an area of at least one county are necessary to insure that the rural as well as the urban population is adequately served, that acute social problems do not develop, and that there is a proper distribution of functions and cooperation between state and local agencies." 5c. (Apply to Superintendent of Documents, Washington, D. C.)

Other Reports Received

Baltimore, Md.—"Guarding the Health of Baltimore." Reprint from Annual Report, City Health Department, 1932. 28 pp.

East Cleveland, Ohio.—Municipal Report, 1932, under commission-manager plan. 24 pp.

East Windsor, Ont.—Report of Committee of Supervisors, August, 1933, surveying past and present financial conditions. 34 pp.

Hartford, Conn.—Annual Report, Board of Park Commissioners, and of the Public Cemeteries, year ending March 31, 1933. 54 pp.

Jackson County, Mo.—"Trends in County Finance." Report by Civic Research Institute, Kansas City, Mo., September, 1933. 34 mimeographed pp.

Kansas City, Mo.—"Charts on Local Government Finance," September, 1933. 31 mimeographed pp. (Apply to Civic Research Institute, 114 W. Tenth St., Kansas City, Mo.)

New York City—Annual Report, Board of Water Supply. 67 pp., with folding tables.

New York City.—Museum of the City of New York, Annual Report, 1932. 75 pp.

New York State.—Department of Health, Annual Report, 1932. 376 pp.

St. Catharines, Ont.—"St. Catharines, Ontario, and the Welland Ship Canal." 32 quarto pp.

Sandwich West, Ont.—Committee of Supervisors, October, 1933. 35 pp.

CONVENTIONS—WHEN AND WHERE

(Figures in parentheses following the name of the convention city indicate the estimated attendance other than local)

December 4-8.—New York. (1,500)
American Society of Mechanical Engineers. Annual meeting. Secretary, C. W. Rice, 29 West 39th Street, New York.

December 7-8.—Washington, D. C. (200)
Highway Research Board of the National Research Council. Annual meeting. Director, Roy W. Crum, B and 21st Streets, Washington, D. C.

December 8-9.—Atlantic City, N. J. (200)
New Jersey Health and Sanitary Association. Annual meeting. Secretary, Dr. Edward Guion, Box 418, Atlantic City, N. J.

December 9.—Washington, D. C.
Association of Asphalt Paving Technologists. Annual meeting. Secretary-Treasurer, W. J. Emmons, 1224 East Engineering Building, University of Michigan, Ann Arbor, Mich.

December 9.—Los Angeles, Calif. (150)
California Conference on City Planning. Annual meeting. Secretary, C. J. S. Williamson, Chamber of Commerce Building, Los Angeles, Calif.

December 28.—New York. (150)
American Water Works Association—New York Section. Mid-winter meeting. Secretary, R. K. Blanchard, care Neptune Meter Co., 50 East 42d Street, New York.

January 6.—Boston, Mass.
Massachusetts State Association of Selectmen. Annual meeting. Executive Secretary, Harris A. Reynolds, 4 Joy Street, Boston Mass.

January 12-13.—Washington, D. C. (50)
American Engineering Council. Annual meeting. Executive Secretary, L. W. Wallace, 744 Jackson Place, Washington, D. C.

January 13.—Providence, R. I.
Rhode Island Town and City Clerk's Association. Annual meeting. Secretary, Alice A. Tonge, Deputy Town Clerk, Town of Warwick, Apponaug, R. I.

January 15-17.—Dallas, Texas.
Texas Water Works Short School. Annual session. Address: V. M. Ehlers, Secretary of the Southwest Water Works Association—Texas Section, Austin, Texas.

January 17-19.—New York.
American Society of Civil Engineers. Annual meeting. Secretary, George T. Seabury, 33 West 39th Street, New York.

January 18-19.—Pocatello, Idaho. (250)
Idaho State Chamber of Commerce. Annual meeting. Secretary, L. F. Parsons, 524 Idaho Building, Boise, Idaho.

January 22. Week of.—Chicago, Ill.
American Road Builders' Association. Annual meeting. Engineer-Director, Charles M. Upham, 938 National Press Building, Washington, D. C.

January 22-26.—Lafayette, Ind. (600)
Purdue Road School. Annual school. Address: Professor Ben H. Petty, Engineering Extension Department, Purdue University, Lafayette, Ind.

January 23-26.—New York.
American Institute of Electrical Engineers. Annual winter convention. Assistant National Secretary, H. H. Henline, 33 West 39th Street, New York.

January 25.—Boston, Mass. (100)
Massachusetts Association of Board of Health. Annual meeting. Secretary, George T. Lennon, Department of Health, Haverhill, Mass.

January 29-31.—Wilkes-Barre, Pa. (250)
Pennsylvania State Association of Township Commissioners. Annual convention. Secretary-Treasurer, H. A. Fitschman, Eagle and Darby Roads, Upper Darby, Pa.

February 5-8.—New York. (200)
American Society of Heating and Ventilating Engineers. Annual meeting. Secretary, A. V. Hutchinson, 51 Madison Avenue, New York.

February 8-9.—Montreal, Que. (300)
Engineering Institute of Canada. Annual meeting. Secretary, R. J. Durley, 2050 Mansfield Street, Montreal, Que.

February 13-15.—Ann Arbor, Mich. (600)
Conference on Highway Engineering—University of Michigan. Secretary, R. E. Morrison, University of Michigan, Ann Arbor, Mich.

February 14-16.—Atlantic City, N. J. (1,000)
Association of Highway Officials of North Atlantic States. Annual convention. Secretary-Treasurer, A. Lee Grover, State Highway Commission of New Jersey, Trenton, N. J.

February 19-22.—Chicago, Ill. (250)
National School Supply Association. Annual convention. Executive Secretary, J. W. McClinton, 176 West Adams Street, Chicago, Ill.

February 20-22.—Toronto, Ont. (300)
American Concrete Institute. Annual convention. Secretary, Harvey Whipple, 641 New Center Building, Detroit, Mich.

February 20-21.—New Haven, Conn. (300)
Connecticut Society of Civil Engineers. Annual meeting. Secretary, H. J. Tippet, Box 235, New Haven, Conn.

February 21-22.—Toronto, Ont. (500)
Ontario Good Roads Association. Annual convention. Address: S. L. Squire, 98 Albany Avenue, Toronto, Ont.

February 24-March 1.—Cleveland, Ohio. (10,000)
National Education Association—Department of Superintendence. Annual meeting. Executive Secretary, Sherwood D. Shankland, 1201 16th Street N. W., Washington, D. C.

March 8.—Concord, N. H. (200)
New Hampshire Good Roads Association. Annual meeting. Secretary, Frank D. Sleeper, Laconia, N. H.

April —.—Augusta, Ga. (250)
American Water Works Association—Southeastern Section. Annual meeting. Secretary-Treasurer, W. H. Weir, 4 Capitol Square, S. W., Atlanta, Ga.

April 2-6.—Los Angeles, Calif. (400)
School of Citizenship and Public Administration—University of Southern California. Annual Institute of Government. Executive Secretary, Walter E. Sykes, University Park, Los Angeles, Calif.

April 4-6.—Toronto, Ont. (300)
American Water Works Association—Canadian Section. Annual meeting. Secretary-Treasurer, A. E. Berry, Ontario Department of Health, Parliament Buildings, Toronto 5, Ont.

June 4-8.—New York. (1,200)
American Water Works Association. Annual convention. Secretary, Beekman C. Little, 29 West 39th Street, New York.

June 14-15.—Green Bay, Wis.
League of Wisconsin Municipalities. Annual convention. Secretary, Frederick MacMillin, 114 North Carroll Street, Madison, Wis.

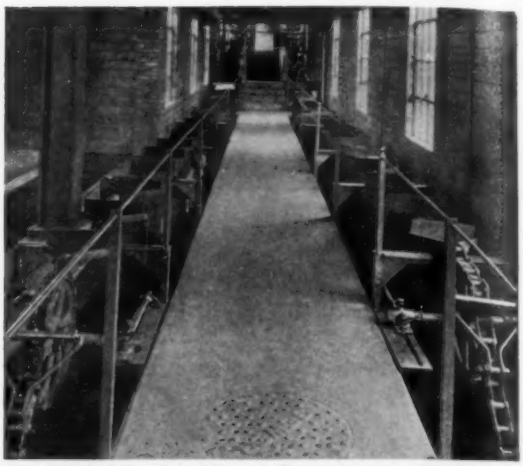
August 23-24.—Wheeling, W. Va. (150)
American Water Works Association—Central States Section. Annual convention. Secretary, H. L. Nelson, 2435 Koppers Building, Pittsburgh, Pa.

September 3-6.—Pasadena, Calif.
American Public Health Association. Annual meeting. Acting Executive Secretary, Kendall Emerson, 450 Seventh Avenue, New York.

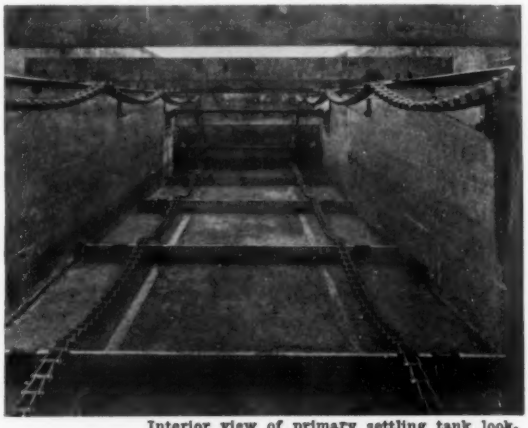
September 17-19.—Santa Fe, N. Mex. (100)
American Water Works Association—Rocky Mountain Section. Annual meeting. Secretary-Treasurer, B. V. Howe, 437 State Office Building, Denver, Colo.

Pat. Pending

An improved Self-cleaning Bar Screen which insures an efficient and thorough screening of sewage. Completely automatic in operation.



Two Single-Unit Grit Channel Conveyors are shown above. This is the most efficient method of grit removal.



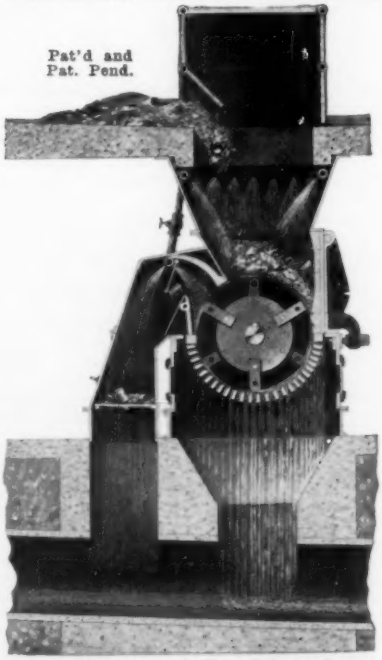
Interior view of primary settling tank looking toward effluent end, showing sludge-collecting flights on tank bottom and returning flights on upper runway acting as skimmers.

Cut Sewage Disposal Costs with . . . . Proved Equipments

To operate your plant efficiently and at low cost it is important that you select the right kind of equipment.

From the diversified line of equipment for Sewage, Garbage and Refuse Disposal Plants, and Light and Power Plants, Jeffrey Engineers can and will help you select the right unit to do your job efficiently and economically.

Some of the proved equipments offered by Jeffrey to lighten the burden and to speed up sewage and garbage treatment processes are shown here. These and others are completely described in our New Bulletin No. 545-C. Send for it today.



Pat'd and Pat. Pend.

Cross-section view of New Jeffrey Sewage Screenings and Green Garbage Grinder. An entirely new process to easily and inexpensively dispose of screenings and garbage by grinding, after which it is discharged into the sewerage system.

The Jeffrey Manufacturing Company

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NEWS AND ILLUSTRATIONS

Items of Interest to City, Town and County Officials, and Others Concerned with the Economical Construction and Efficient Operation of Public Improvement Undertakings

A Gasoline and Oil Separator for Garages

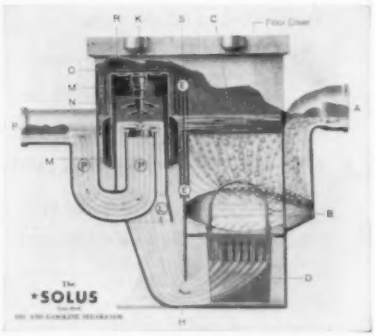
Sewer explosions caused by the ignition of oil diluted with gasoline from garages and solvents from cleaning plants are of all too frequent occurrence. They can be eliminated by keeping the explosive liquids from the sewer by the use of a proper separator. The Central Foundry Co., 420 Lexington Avenue, New York, has developed the Solus separator, which provides explosion-proof protection for garages.

The Solus separator has a body and intercepting trap made of extra-heavy non-corrosive cast iron divided by a partition wall into two chambers, all of which, together with the inlet, outlet and interior piping, are cast in one piece. Only the float and its valve and seat ring are brass. The separating chamber receives from the floor drain the mixture of water, oil and gasoline and solids, which is guided downward in a tangent direction to an enlarged area, thereby effecting a reduction of flow and velocity and permitting the oil and gasoline to rise to the top.

Solids settle to the bottom of the separating chamber and are caught in an easy-to-handle clean-out bucket. This bucket is slotted and permits uninterrupted flow of water. Free of solids, the oil and gasoline, separated from the water, pass through a slot in the partition wall to the float chamber, the integral construction of which includes the outlet pipe and a tubular member. The slot in the partition wall permits the oil and gasoline to form a layer of the same thickness in both chambers. The outlet pipe is surrounded and guarded by the tubular member, which extends above the water level. Over the tubular member is the inspection cover, a fixed hood forming an air seal which prevents any liquid from passing over the top of the tubular member.

Surrounding the tubular member is a brass float which is sensitive to, and actuated by, the difference in specific gravity of water and oil. This brass float floats in water and sinks in oil and gasoline. When the oil and gasoline accumulation at the top of the two chambers is not removed, the brass float sinks, and the safety valve or float valve inside the brass float simultaneously closes the outlet pipe. The outlet pipe remains completely closed until oils and gasoline have been removed.

To clean, there is no need of removing the floor cover where a hand pump with an oil-emptying line is connected with the separating chamber. A turn of the pump handle draws off all oil and gasoline into a pail or any other handy receptacle. Where a pump is used, removal of the floor cover is necessary only for inspection and emptying of the silt bucket. This method of cleaning does not interfere with the continuous inflow of floor drainage. Neglect to clean the separator, however, shuts the outlet tight.



THE SOLUS OIL TRAP AND SEPARATOR

Emulsified Asphalt for Low-Cost Construction

Emulsified asphalt can be used with a great variety of aggregate such as limestone, trap rock, gravel and sand, depending upon the type of pavement to be constructed. For each method of construction and for any aggregate which may be available, there is a type of emulsified asphalt of suitable characteristics. The Technical Bureau of The Barber Asphalt Co., Philadelphia, Pa., makes examinations of samples of aggregate to be used by municipalities purchasing Barber products and recommends the proper type of emulsified asphalt.

These emulsified asphalts are used for penetration macadam, pre-mix asphalt macadam, surface treatment, mixed-in-place construction, road maintenance and patching, resurfacing old worn brick, gravel, concrete, granite block and asphalt roads, widening existing roads, airport runways, playgrounds, parking areas, construction of railway grade crossings and station platforms, tennis courts and footwalks. Barber emulsified asphalts are made with high-grade straight-run steam-refined asphalts and are applied cold so that the city saves the cost of heating. They can be shipped and stored at all atmospheric temperatures above freezing for many months without separation or sedimentation. They can also be used satisfactorily in cold, damp or wet weather, as well as in midsummer. Only heavy rain or freezing temperatures can stop construction, and work can be resumed immediately after a rain or sudden shower.

Owing to its fluidity and covering capacity, Barber emulsified asphalt permits the filling of voids with clean stone chips and the coating of the aggregate to the bottom with a thin, uniformly distributed film of asphalt, thus securing a dense, stable pavement without an excess of bitumen to produce bleeding.

These emulsified asphalts contain no cutting agents or solvents and hence are not a fire hazard. They set quickly, permitting the road to be thrown open to traffic almost immediately after the job is completed. Barber emulsified asphalts contain a minimum amount of emulsifying agent, and it is not necessary to dry out the mineral aggregate used with them, as is the case when cut-back or hot materials are used.

IMPROVING 1½ MILES OF FERN DRIVE IN FULLERTON, CALIF., WITH AN ALLIS-CHALMERS 35 TRACTOR AND BLADE

NON-SKID even when WET!

MASTIPAVE has conquered the skid hazard. Wet or dry, a MASTIPAVE floor is *non-slip*. Reduces injuries and loss of time from slippery floor accidents. Avoids damage claims. Provides valuable protection to employer and employee.

Wherever there is a slippery-under-foot problem, this Magic Floor solves it . . . permanently. Industrial and public building floors . . . entrance steps and halls . . . ramps and gang planks . . . street car and bus platforms and steps . . . made safe by MASTIPAVE.

Waterproof, rot-proof, vermin-proof. Resilient, quiet. No other floor covering gives such long trouble-free service at so low a cost.

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For Luncheon, Dinner, Supper
Moderate Prices

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and addresses of reliable manufacturers of any kind of machinery or material for use in connection with municipal improvement work of any kind? If so, please advice us as to your wants, and we will arrange to have any desired catalogs or prices forwarded to you promptly.
This is a service which we render without charge to all readers of THE AMERICAN CITY or THE MUNICIPAL INDEX. and we hope you will take frequent advantage of it.

THE MUNICIPAL INDEX
470 Fourth Avenue, New York

THE WESTERN SNOW-PLOW FOR LIGHT TRUCKS

A New Hydraulic Snow-Plow

A high-speed snow-plow that fits any 1½-ton truck is a recent product of The Austin-Western Road Machinery Co., 400 North Michigan Avenue, Chicago, whose broad line of snow-removal equipment embraces all types of plows for both truck and tractor use. Tapered and deeply curved to pick up, "spiral" and throw the snow, this plow can be worked at the highest operating speeds; the pronounced curve of blade successfully prevents snow from clouding the windshield and clogging up the radiator. A few easy strokes by the driver within the cab operates the hydraulic (oil) pump to raise the blade; turning a small thumbscrew valve lowers the blade rapidly or slowly as desired or locks it in place. A simple but rigid attachment to the front of the truck makes for quick mounting to, and easy removal from, the truck. A novel toggle release permits obstructions to pass under the blade when it strikes a manhole cover, traffic marker, etc.; the blade readily assumes its normal position when the truck is backed up. This snow-plow attachment, known as the No. 1½, provides the utmost in driver convenience and safety.

A Black Top Machine for Mixed-in-Place Work

The Parsons Turbo Mixer, which consists of batteries of angular vanes which ride on the subgrade and bring the fines up through the oil, giving a true and rapid mixing action, has been developed by the Parsons Co., Inc., Newton, Iowa. The rear unit of the mixer includes a cross mix blade which can be put in action where any streakiness appears. It can also be used for leveling and trimming the spread during the mixing process. A trimmer on the right side is used to return oil run-off to the aggregate and trim the edges to line.

It is reported that one of these units, with a blade to trim and spread, has equaled the work of three or four blades. On a typical job, a distributor shoots 80 per cent asphalt oil on a spread of gravel of 850 cubic yards to the mile, using an average of 15,000 gallons of oil to the mile. The Parsons Turbo is run over the road, permitting the material to surge through the vanes. The vanes are so arranged that there are five surges in each traverse of the machine. At the end of mixing, the material has a uniform color, indicating thorough mixing. On the final passage, the material is left in numerous small windrows which facilitate the final spread with a patrol blade, ahead of rolling, or leaving the road for packing by traffic.

The Parsons Turbo Mixer and Agitator is 22 feet long, 8 feet 6 inches wide, and stands a maximum of 8 feet in height. It has a wheelbase of 12 feet 6 inches, and the vanes cover a width of 8 feet 6 inches of road. The rear spreader blade is 12 feet long and 1 foot 10 inches deep. The machine fully equipped weighs approximately 8,000 pounds.

Consulting Engineers Change Firm Name

The well-known firm of hydraulic and sanitary engineers, Pearse, Greeley & Hansen, 6 North Michigan Avenue, Chicago, Ill., has changed its name to Greeley & Hansen. The offices will be continued in the same location, and the services of this organization will as heretofore be available to municipalities for reports, the design, and construction of water-supply and purification plants, sewerage, sewage disposal plants, garbage and refuse disposal plants, the treatment of industrial wastes, sanitary surveys, analyses, supervision of operation and valuations.

A Warning Torch for All Weathers

Torches for use as warning signals to mark detours, trenches, soft shoulders along new highways, and other points on construction contracts where traffic needs some warning of an inexpensive nature, have been developed by the Shanklin Manufacturing Co., Springfield, Ill. This new Storm King torch has a cap which does not have to be screwed on; hence it will not bind, since there are no threads to get clogged with dirt. The guard over the top so controls wind movements that it gives an even flame to the very last drop of kerosene. Any slight deposits of carbon which may collect on the guard can be eliminated simply by knocking the flame guard against the torch.

The flame guard and the wick holder are all in one, so that there is no danger of losing one of the parts. The Storm King top hangs over the side of the bowl by its wick, and when filling is completed, the cap and wick, in one piece, is ready to be put back into secure position for burning. This torch, which is 8 inches by 7¼ inches wide, holds three quarts of kerosene, and it won't tip over whether empty or full, for it has a scientifically weighted bottom that will pull the torch back to an upright position no matter how badly it is tipped. The weight is welded to the bottom of the corrugated torch. The torch is also equipped with a handle so that six or more can be carried at a time when they are being unloaded or loaded. The corrugations increase the strength of the torch, preventing crushing.

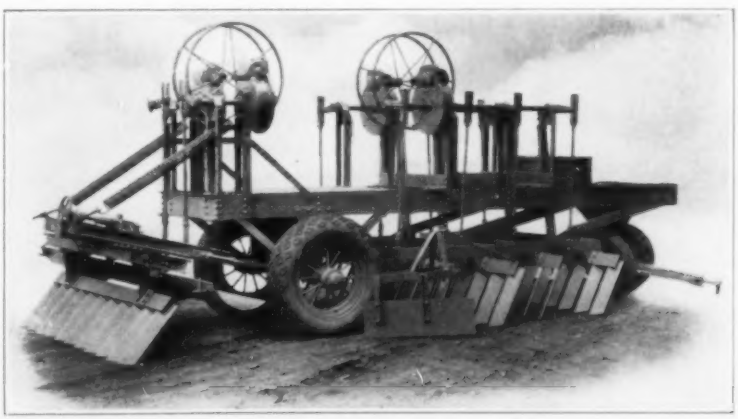
THE STORM KING WARNING TORCH

New York Offices of General Electric Moved

General Electric Co. and four of its associated companies have announced the removal of their offices in New York City to the new General Electric Building, 570 Lexington Avenue at 51st Street. The field engineering division, except the New York district engineer and the application engineering division, which are now in the new building, the construction division, order service division, New York service shop and the warehouse are still located at the service building of the company at 414 West 13th Street.

Jones Joins Stowitts in Consulting Practice

George P. Stowitts, civil and consulting engineer, Transportation Building, Cincinnati, Ohio, has announced that Pusey Jones will hereafter be associated with him as partner, and the organization will be known as Stowitts & Jones and will engage in consultation, reports, design and the supervision of construction.



THE PARSONS BLACK-TOP MACHINE

GENERAL ILLUMINATION ENGINEERING CO.

Cincinnati, Ohio . . . . . Carew Tower

Is your street lighting system an asset . . or a liability?

The true value of street lighting is not measured by energy consumption, or the amount of light used. True value is measured by the quality of illumination, and its ability: to reduce accidents, theft and crime; to increase safety and convenience; to create a more attractive city. Liteindex specified illumination assures "true value" street lighting at no additional expense, and frequently with sharp savings. Write General Illumination Engineering Co., Carew Tower, Cincinnati, Ohio.

STREET LIGHTING
- ZONING SURVEYS
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- CONTRACT SUPERVISION

FLOODLIGHTING
- AIRPORT
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- DISPLAY
- INDUSTRIAL
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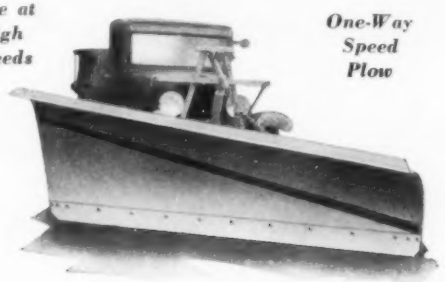
GOOD ROADS CHAMPION
SNOW PLOWS

Blade and V-Type for All Makes and Sizes of Trucks

Safe at High Speeds

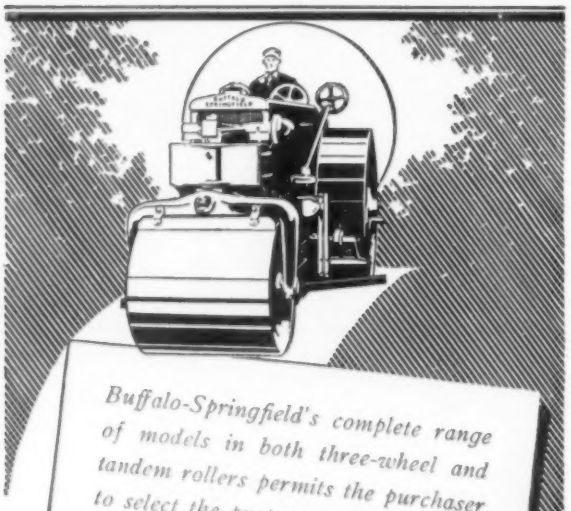
One-Way Speed Plow



Model 31 . . . . . for 1½-ton Trucks
Model 32 . . . . . for 2-2½-ton Trucks
Model 33 . . . . . for 3-5-ton Trucks

IMPORTANT FEATURES — Special high-speed moldboard with snow shield, adjustable for varying snow conditions, and equipped with quick-acting safety trip device; 10 in. diameter, roller bearing, full swiveling castors, adjustable for edge wear;—underframe attachment to truck;—hydraulic lift.

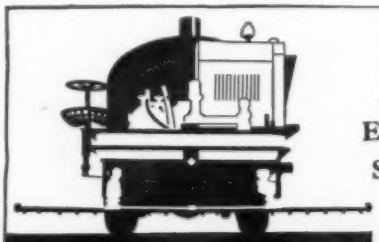
GOOD ROADS MACHINERY CORPORATION
KENNETT SQUARE, PA.



Buffalo-Springfield's complete range of models in both three-wheel and tandem rollers permits the purchaser to select the proper machines for his work.

The Buffalo-Springfield Roller Co.
Springfield, Ohio

BUFFALO-SPRINGFIELD



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Spread full width street or road at one time or any part thereof.

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Write for descriptive bulletin.

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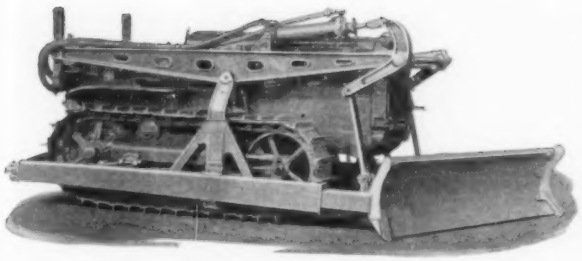


THE WOOLDRIDGE HYDRAULIC TRAILBUILDER MOUNTED ON A McCORMICK-DEERING T-40 TRACTRACTOR

Hydraulic Trailbuilder

Wooldridge trailbuilders and bulldozers, which have been well known in the National Park and Forestry Service and in Western lumber camps, are now manufactured and distributed by the Continental Roll & Steel Foundry Co., East Chicago, Ind., with sales offices at 332 South Michigan Avenue, Chicago, Ill. The Continental Roll & Steel Foundry Co., operating steel plants in East Chicago, Ind., Wheeling, West Va., and Pittsburgh, Pa., has established the Chicago office for its Industrial Equipment Division for merchandising heavy tractor-operated equipment.

Wooldridge hydraulic trailbuilders have established distinctive records of low-cost work due in great measure to the ease of maneuvering the blade, which is powered both up and down and also adjustable to many horizontal hills and mountains. The Wooldridge hydraulic pump is a gear oil pump operating at low pressures, and supplies oil through a 4-way valve. This valve is readily responsive to the operator and, in conjunction with the rear adjustments of the rocker arm, eliminates lost time in maneuvering the blade. The trailbuilder has an angling device that can be used on either side or operated as a straight blade bulldozer.

Continental built equipment combines the new Dynamic steel with high quality welded construction. Dynamic steel is a recent Continental development in steel alloys which will stand up under tremendous and continuous shock, and is especially adapted to rock- and dirt-moving equipment operating with crawler tractors.

Chain Link Wire Fences for Tennis Courts

As part of the program of relieving unemployment, many cities have improved their parks and playgrounds, thus continuing the effort of progressive cities in furnishing recreational areas for their citizens. Providing a permanent type of enclosure or backstop for tennis courts is important. The ordinary chicken wire rusts out quickly and must be replaced immediately. Stewart chain link wire fences, made by Stewart Iron Works Co., Inc., 915 Stewart Block, Cincinnati, Ohio, furnished in 8-, 10- and 12-foot heights, are particularly adaptable for tennis-court enclosures. The chain link fabric is of copper bearing material woven in a 2-inch mesh or a No. 11 gage in a 1¾-inch mesh with twist and barbed finish at the bottom and knuckled finish at the top. The fabric is galvanized by the hot dip process after being woven, and under test gives a tensile strength of over 70,000 pounds per square inch.

The framework for this fence is made of standard open section galvanized beams or galvanized pipe. The open section framework is recommended because of greater strength, weight and corrosion resistance. The line posts are 2¼-inch oval back I-beams set 3 feet into 10-inch concrete footings, and with the concrete extended 4 inches below the posts, which are spaced not more than 10 feet apart on centers. A top rail is recommended, joined with expansion sleeve couplings. If the top rail is omitted, a No. 6 coiled spring wire is used instead. The terminal, end corner and gate posts are 3-inch I-beams set 3 feet into 12-inch diameter concrete footings, which are extended 4 inches below the posts. The heavy-weight fencing is braced with 1¾-inch oval back I-beams with a ½-inch round adjustable truss rod or a 1⅝-inch pipe with a ½-inch round adjustable truss rod. There is one brace assembly for the end and gate posts, and two brace assemblies for corner posts.

Hibben Given Roving Assignment by Westinghouse

Samuel G. Hibben, Manager of the Commercial Engineering Department of the Westinghouse Lamp Co., Bloomfield, N. J., for the last fifteen years, has been appointed Director of Lighting. In this new position he will function as an ambassador-at-large on all lighting activities, keeping in close touch with new lighting developments as they take shape in the research laboratories and following them through to their final application in the field. A Century of Progress has spread new thoughts of artificial lighting throughout the United States, and the Better Light—Better Sight activity of the industry is capitalizing on this awakening interest.

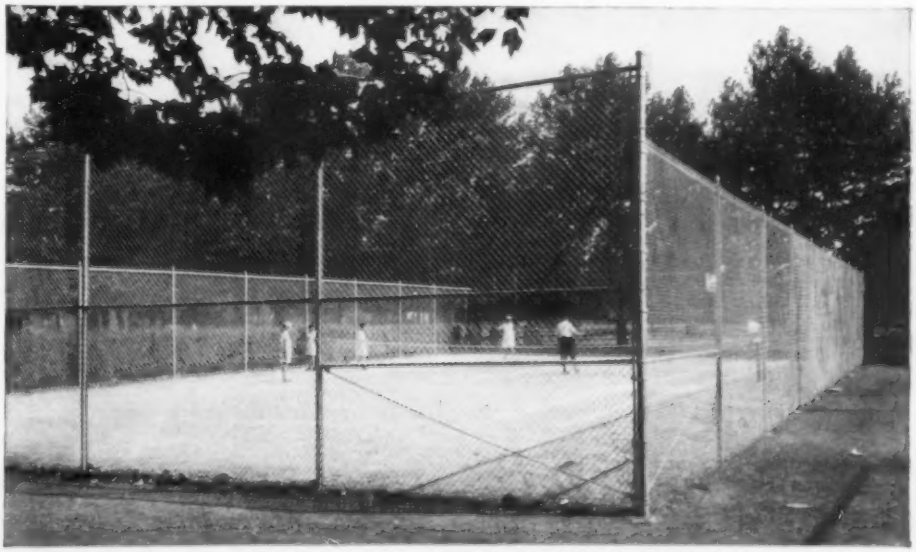
Increase in Sales Volume

R. W. Sparling, Los Angeles, Calif., reports a very gratifying response to his action in establishing sales and service offices in New York and Chicago. Judging from sales as well as inquiries coming from widely scattered districts, there is due to be a large increase in equipment installations during the next year.

The R. W. Sparling Co. manufactures a main-line meter as well as complete recording and totalizing equipment, and it has been found that especially where Federal money is being used for improvements, the need for increased efficiency to insure paying back the funds justifies the use of a closer check-up of pumping costs through the medium of a main-line meter installation.

McBride Joins National Meter Co. Sales Staff

J. A. McBride, assistant engineer of gas distribution, United Engineers & Constructors, Inc., Philadelphia, Pa., has resigned to become sales engineer for the National Meter Co., 4207 First Avenue, Brooklyn, N. Y. Mr. McBride, who has become well known in the gas industry since 1924, will represent the National Meter Co., nationally, on meter sales. During his service with United Engineers & Constructors, Inc., Mr. McBride handled engineering and sales work on many unusual pipe line jobs in various sections of this country.



A STEWART CHAIN LINK FENCE ENCLOSING A MUNICIPAL TENNIS COURT

A policeman every 50 yards!

Efficient, modern street lights are like auxiliary policemen . . . Their revealing glow drives law-breakers away They help *prevent* crime by lighting up the dark corners where crime breeds. ¶ Here's a pertinent fact. In one city crimes decreased 41 per cent in those sections where better street lighting was installed. Good street lighting makes police work easier. ¶ With well-lighted streets, traffic speeds up . . . accidents decrease . . . business improves. ¶ If there's a limited city budget to be met, an economical installation may be had through careful planning. Substantial savings may be made by checking *both* original costs and maintenance costs . . . by wise selection of standards . . . by proper spacing. ¶ These involve complex problems. Graybar's experienced street lighting specialists are both well qualified and willing to help you solve such problems.

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OFFICES IN 73 PRINCIPAL CITIES. EXECUTIVE OFFICES: GRAYBAR BUILDING, NEW YORK, N. Y.

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Outdoor Lighting

A Section of *The American City*
Devoted to the Lighting of Streets, Highways, Bridges, Airports, Athletic Fields and Parks, and the Floodlighting of Public Buildings

Street and Highway Lighting on a Better-Seeing Basis

By SAMUEL G. HIBBEN
Director of Lighting, Westinghouse Lamp Company, Bloomfield, N. J.

A NEW illuminant, the lamp radiating light from vaporized metallic sodium, is receiving practical service tests on city streets. Following closely after several trial installations of sodium vapor illuminants in European countries, supplemented by experimental testing of highway lighting equipment in this country, the first finished installation of sodium lamps on ornamental standards was dedicated in Port Jervis, N. Y., November 9, 1933. This installation seems of particular consequence since it ushers in an entirely new form of lamp, possessing radically different characteristics of color, of glare, and with peculiar performance features, and since it exemplifies a method of extending and increasing street and highway lighting on a new "better-seeing" basis.

New Features

Chief among the items wherein the sodium lamp differs from the Mazda filament light source, is the golden color and the larger area of the light-giving part, which in turn makes for almost glareless street lighting and for a much higher degree of visibility—that is, for eye comfort. As further experience with sodium lamps is obtained in this country, it may be that a considerably higher level or intensity of road surface illumination can be secured, but as to the economics of this new system, considerable further work must be done before one can predict how its costs will compare with those of existing systems.

The Port Jervis Installation*

At Port Jervis approximately 3,000 feet of concrete highway is illuminated, using ornamental steel standards spaced 125 feet apart along the outer edge of the roadway, some 6 feet from the paving line. This is a two-lane 30-foot width highway extending from the edge of the business district into the suburbs and constituting part of a main artery for east-and-west traffic. Mounted on the top of each standard at a height of approximately 14 feet is a Westinghouse sodium vapor lamp bulb nominally rated at 4,000 lumens, enclosed in a heat-insulating vacuum cylinder or flask, and in turn surrounded by a Holophane No. 4473 Bilux bowl refractor. The ornamental steel pole and lighting fixture, furnished by Line Material Co., includes a Gillender special light density opalescent outer globe, some 18 inches in diameter.

Within the base of each post is mounted a Westinghouse transformer operating on the 6.6-ampere series primary circuit and delivering to each sodium lamp, through the four-wire secondaries up the posts, the two voltages required for lamp operation. The series circuit for this group of sodium lamps is part of a straight A.C. system now feeding other series Mazda filament lamps in the city, and from a standard automatic tub transformer. A clock switch throws in the lamps at dusk, and they burn until dawn, approximately fourteen hours at this season.

The Question of Cost

The Port Jervis installation, having been made a part of Mayor Wendell Phillips' unemployment relief program, is city-owned property, including the ornamental standards and feeder circuits. Power to this installation is supplied by the Rockland Light and Power Co. When in full operation, the power consumed per lamp is slightly under 100 watts, and hence the over-all efficiency of the secondary wiring, etc., is in the neighborhood of 40 lumens per watt. This efficiency, it will be noted, is almost twice that of the corresponding metallic filament lamp, and herein lies one especial virtue in the metallic vapor illuminants. Be it said, however, that until a volume

SPECIAL SERIES TRANSFORMERS FIT INTO THE BASE OF EACH STANDARD

* See the cover of this issue, and also page 45.

production of sodium lamps develops and becomes standardized in this country, the cost per bulb must be considerably higher, and the question of the total cost of delivered lumens over a period of time will have to be answered after some months' further experience. Utility equipment and servicing must be carefully—and slowly—adjusted to such a new development. It must not be expected that revolutionary wonders can be accomplished suddenly. Details—some very serious—are yet to be worked out.

Better Visibility—Highway Safety

More important, however, than the actual measured foot-candles of illumination is the net seeing ability and the night safety afforded vehicular traffic. Due partially to the lack of glare, and more especially to the monochromatic quality of the light, it is self-evident to any one traveling this stretch of highway that a higher degree of visibility is obtained than is usually experienced. Even under the rather low intensities prevailing,—somewhat less than one-quarter foot-candle,—the details of vehicles and all roadside objects seem unusually clear-cut, and visual acuity seems sharpened. It is difficult to definitely evaluate this quality of sodium lamp lighting, but under the intensities now prevailing on streets and highways this effect seems to be accentuated, whereas the golden yellow color seems less radical and more agreeable than may be the case if such monochromatic sources be used in interiors.

According to the City Engineer, Louis Kadel, this installation is receiving an extraordinary amount of favorable comment, and it is hoped it may be extended in the near future to the Port Jervis business districts. When inaugurating trial installations with the sodium lamps both here and abroad, it was considered preferable to plan the installations for interurban highways or for routes handling primarily vehicular traffic and not likely to have a high percentage of pedestrians. This choice was partially based upon the question as to whether the monochromatic yellow color, incapable of correction by the screening method of accessory glassware, might prove unfavorable to human complexions, etc. Where the sodium lighting intensities are low as compared to sidewalk illumination from show windows, it is quite likely that this red-deficient color is so diluted as to be unobjectionable;—as a matter of fact, a certain virtue seems to lie in the cheerful and distinctive warm golden color quality. Another element that suggests the highway as a promising type of thoroughfare to be made safe for traffic by sodium lighting, lies in the matter of the distribution system. If less copper, or higher primary voltages, or a minimum of power be required, then sodium lamps should be thoroughly investigated. Hence this pioneering installation is invaluable.

A Successful Beginning

From an engineering point of view, the Port Jervis installation not only marks an important trial of an ornamental sodium lamp system but is unique in that the particular design of sodium lamp developed in The Research Laboratories of the Westinghouse Lamp Co. operates from an alternating current supply, without the necessity of complicated direct current accessories such as first used abroad. All in all, great credit is due the city executives and those supplying power and equipment in making this trial installation a practical success. Even though a forward step in street lighting seems indicated, and even though with the same power consumption a much higher intensity and a better quality of street lighting seems destined to evolve, no one should become optimistic to the extent of forgetting that the sodium lamp is a radically new illuminant. It is still destined to go through considerable improvement and several stages of perfection, and is still limited to special services—not by any means economically justified as a substitute for Mazda filament lamps in general at this stage of the art. It should rather be considered a supplementary means of creating a new interest in street-lighting improvements, and hailed as a potential benefit to seeing and safety.

VIEW ALONG PARK AVENUE, PORT JERVIS, SHOWING THE ORNAMENTAL SODIUM LAMP UNITS

New Street-Lighting Equipment

THREE new units of street-lighting equipment have been announced by the General Electric Company. A new luminaire, with no external live parts, a 30-ampere switch for the control of multiple street-lighting circuits, and a cut-out equipped with a Thyrite by-pass are included.

The new Form 72 luminaire is a suspension assembly for highways and secondary municipal thoroughfares. It consists essentially of a porcelain insulator supported around the waist by a clamp attached to the end of a straight pipe bracket. The insulator is adapted for mounting a radial-wave reflector or a cast iron reflector for use with glassware. In the new design the middle-supported porcelain relieves the top from strain, the absence of external binding posts eliminates some resistance, and lack of external split in the duplex cable at the luminaire removes the possibility of insulation breakdown from weather.

The new 30-ampere switch (Type CR7843) is designed primarily for multiple street-lighting circuits, and has a capacity above its normal rating to withstand the high inrush currents of lamp loads. Moving parts have been minimized, with the elimination of toggles, levers, links and such parts that might cause chattering, burning of contacts, or faulty operation. A magnet-type operation is used, and metal parts are nonferrous. A lightning arrester is built into the case. All parts can be replaced from the front of the case without moving the switch mechanism.

NOVALUX FORM 72 LUMINAIRE WITH GLEASON-TIEBOUT RIPPLED GLOBE

Addition of the Thyrite by-pass means that the new cut-out acts also as a surge-voltage by-pass, safeguarding street-lighting transformers and loops from traveling voltage surges, without service interruption or damage to the equipment. In addition, the new cut-out will positively shunt the transformer or loop in case of a sustained open circuit in either the loop or the transformer.

THE AMERICAN CITY should always be mentioned when writing for this material which is furnished free.

CITY EQUIPMENT and MATERIALS CATALOG DATA

Keep your files up to date by checking over these items each month and writing for those you need.

BRIDGE AND CULVERT CONSTRUCTION BY HAND LABOR

606. Armco Multi Plate, made by Armco Culvert Mfrs. Assn., Middletown, Ohio, which is quickly and easily erected by unskilled labor in diameters up to 10 feet and larger for culverts and small bridges, is described in the new Armco Multi Plate catalog, which will be sent to municipal officials or contractors free on request.

A MOBILE SNOW AND SLUSH BROOM

607. Complete information regarding the new revolving broom unit mounted on a Mercury Type "D" industrial tractor for snow sweeping and removal of slush at street intersections and for following up plowing equipment handling heavy snowfalls, may be secured from the Mercury Mfg. Co., 4118 S. Halsted St., Chicago, Ill.

SAFETY IN POLICE MOTORCYCLES

608. Low center of gravity, correct wheelbase and balance, and perfected spring suspension, are the basic reasons for the amazing steadiness of Harley-Davidson motorcycles at all speeds and on all road surfaces. Interesting literature on police motorcycles may be secured from Harley-Davidson Motor Co., Dept. M., Milwaukee, Wis.

PORTABLE PUBLIC ADDRESS SYSTEMS

609. The Western Electric Public Address and Program Distribution Systems for schools, municipal auditoriums and outdoor public events are described in detail in an illustrated booklet which may be secured from the Graybar Electric Co., Graybar Bldg., New York.

CUTTING SNOW-REMOVAL COSTS WITH TRUCKS AND TRACTORS

610. International trucks in sizes from ½-ton to 7½-ton with various bodies and equipment are suitable for every kind of road and municipal work. The McCormick-Deering TracTracTor is an accessible crawler-type tractor with steering clutches and steering brakes that can be inspected, adjusted or replaced through the cover plates without disturbing the tracks, rack frames or driving sprockets. Complete information concerning these tractors and trucks for snow removal will be sent on request by the International Harvester Co. of America, Inc., 606 S. Michigan Ave., Chicago, Ill.

FERRIC CHLORIDE FOR DEWATERING SEWAGE SLUDGE

611. The disposal of sludge is the sewage disposal problem. Many municipalities are now using ferric chloride, which is the most powerful dewatering agent known for conditioning sewage sludge for filtration, incineration and fertilizer manufacturing. Complete information regarding the use of ferric chloride for sludge treatment, as well as other chemicals for municipal purposes, including black alum, sodium aluminate, chlorine, Perchloron, chloride of lime, caustic soda and alum, may be secured from the Pennsylvania Salt Mfg. Co., Widener Bldg., Philadelphia, Pa.

PROTECTING MUNICIPAL BUILDINGS FROM WATER DAMAGE

612. The installation of Gamewell Sprinkler Watchman master type fire-alarm boxes insures the prompt arrival of fire department apparatus at the scene of a fire, thus greatly reducing the possibility of excessive water damage. Complete information may be secured from The Gamewell Co., Newton, Mass.

PROTECTING CONCRETE STREETS FROM EXPANSION DAMAGE

613. Not only concrete but block type pavements are protected from expansion damage through the proper installation of Carey Elastite expansion joints, which are completely described in literature which may be secured from The Philip Carey Co., Lockland, Cincinnati, Ohio.

GATE VALVES WITH DISTINCTIVE FEATURES

614. The Eddy valve has a number of distinctive features which it will pay you to study. For example, the gates are free to revolve on the trunnions, so as not always to seat in the same position. Further details may be secured from the Eddy Valve Co., Waterford, N. Y.

MUNICIPAL ECONOMY THROUGH CLEAN MAINS AND REDUCED PUMPING COSTS

615. Water-works economy is a thought uppermost in the minds of water-works officials today. Definite information as to how operating costs can be reduced through inexpensive cleaning of the water mains to reduce the friction losses and consequently reduce pumping costs may be secured from the National Water Main Cleaning Co., 50 Church St., New York.

VALVES AND FIRE HYDRANTS

616. Rensselaer valves and Corey hydrants, as well as tapping sleeves, tapping valves, crosses, split repair sleeves, post indicators, floor standards, air valves, valve boxes, grease cases, etc., are described in Catalog G of the Rensselaer Valve Co., Troy, N. Y.

PIPE MADE BY LOCAL LABOR

617. Lock Joint reinforced concrete pipe of the pressure type for water works or for sewer or culvert construction, all of which is manufactured within the community in which it is used, employing local labor, is described in literature which may be secured from the Lock Joint Pipe Co., Ampere, N. J.

MORE WATER-WORKS INCOME BY INCREASED METERING

618. Now is the time to get more money for your water-works service—not by increasing the cost of legitimate uses of water but by eliminating waste. Complete information as to how water meters fit into the picture may be secured from the National Meter Co., 4201 First Ave., Brooklyn, N. Y.

COPPER TUBING FOR ECONOMICAL WATER SERVICES

619. The use of copper water tubing for water services is on the increase everywhere. Its long life makes it attractive to the builder and owner, especially as it can be installed at little added cost over the cost of other materials commonly used which have a much shorter life. Complete information may be secured from the Copper & Brass Research Assn., 25 Broadway, New York.

GAS ENGINES FOR STANDBY SERVICE

620. Standby service and peak loads are particularly the assignments for Sterling high-duty internal-combustion engines built in units from 12 to 565 bhp. Multiple units at $21 a horsepower will handle peak loads, which sometimes prevail only an hour or two and which do not justify the heavier cost of steam or oil engines. Complete information is available from the Sterling Engine Co., Dept. C-11, 1270 Niagara St., Buffalo, N. Y.

HIGHWAY GUARD BUILT ON A NEW PRINCIPLE

621. The Rotary Safety Highway Guard, designed to meet the severe traffic conditions of the present time and avoid damage to car and injury to occupants, consists of a horizontal pipe mounted on suitable bearings, permitting it to rotate freely and prevent the car from climbing the guard. A complete description will be found in the illustrated folder of the Machined Steel Casting Co., Alliance Ohio.

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Municipal Garbage Incinerators

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913 Tuttle St., Des Moines — Room 915, 270 Broadway, New York
Chicago Dallas Seattle San Francisco

SHAPING ILLUMINATION TO YOUR STREETS

622. Holophane refractors alone shape the light to the street and are standard equipment on most types of street lighting units. Engineering service or information may be secured from Holophane Co., Inc., 342 Madison Ave., New York.

WATER METERS WITH INBUILT INTERCHANGEABILITY

623. The manufacturers claim that Trident and Lambert water meters are "the last water meters you will ever have to buy," because of the interchangeability of all parts of these meters, whereby those that have seen a generation of service can be made as good as today's with new improved stock parts. Catalogs may be secured from the Neptune Meter Co. (Thomson Meter Corp.), 50 E. 42nd St., New York.

A LOW-PRICED TRUCK WITH A LOW RATIO REAR AXLE

624. Truck buyers are choosing more Chevrolets than all the rest of the trucks on the market put together, according to the Chevrolet Motor Co., Division of General Motors, Detroit, Mich., which will be pleased to supply municipal officials with complete information regarding the features that have created this demand.

WOOD AND STEEL TANKS AND TOWERS

625. W. E. Caldwell Co., Inc., Louisville, Ky., will be pleased to send a copy of its 50-page illustrated catalog containing a complete listing of round, rectangular and other shaped wood tanks for all purposes, tank agitators and stirring devices, and tank gages, as well as vertical and horizontal, cylindrical and rectangular steel tanks and elevated tanks for equalizing pressure in water-works systems.

CONCRETE AND HIGHWAY SURFACERS

626. The latest loose-leaf catalog of the Concrete Surfacing Machinery Co., 4559 Spring Grove Ave., Cincinnati, Ohio, contains complete descriptions of Berg concrete surfacers and Hi-Way surfacers with attachments and accessories for surfacing, cleaning, polishing, chipping, bush hammering, channeling and drilling concrete, stone, metals and all other hard materials.

CEMENT-BOUND MACADAM MAINTENANCE COSTS

627. A 15-page 8½ x 11 bulletin on cement-bound macadam maintenance costs, which includes detail summaries and charts of street maintenance for cement-bound macadam, concrete and other types of pavement, covering the last 15 years in Portland, Ore., has been issued by the Portland Cement Assn., Room 2312, 33 W. Grand Ave., Chicago, Ill. It will be furnished to any municipal official free on request.

STANDARD AUTOMATIC PRESSURE-CONTROL VALVES

628. The Ross automatic pressure-control valves, as well as Ross feed water filters, portable fire hydrants, hydraulic engines and hydraulic booster pumps, are described in the literature of the Ross Valve Mfg. Co., Inc., Archibald St., Troy, N. Y.

ASPHALT FOR PENETRATION METHOD CONSTRUCTION

629. Data on Socony asphalt binder B for penetration method construction, and complete particulars regarding specifications, and other information, may be secured from the Standard Oil Co. of New York, Inc., 26 Broadway, New York.

HIGHWAY STRIPING OUTFIT

630. The DeVilbiss highway striping outfit Type HS, which is made for attaching to a running-board of a motor truck or as a trailer, is described and illustrated in literature which may be secured from DeVilbiss Co., Toledo, Ohio. The outfit operates pneumatically and paints a stripe from 4 to 6 inches wide at a speed of 6 to 8 miles an hour.

ELEVATED STEEL TANKS FOR MUNICIPALITIES

631. Graver elevated steel tanks are more than mere storage tanks—every Graver tank is designed after careful study of the particular problem at hand, and combines in the finished product the latest and most scientific engineering designs and manufacturing practice. The Graver Tank & Mfg. Corp., East Chicago, Ind., will be pleased to furnish complete information regarding its eliptical bottom elevated tanks and other designs for municipal water-works service.

ICE CONTROL PRACTICE IN THE UNITED STATES

632. The Columbia Alkali Corp., Barberton, Ohio, has published a folder on ice control practice in the United States and Canada, which tells how to make ice skid-proof. Copies of this bulletin may be secured free on request.

MODERN WATER PURIFICATION PLANT EQUIPMENT

633. International Filter Co., 59 E. Van Buren St., Chicago, Ill., manufacturer of a wide range of products for efficient, up-to-date water purification plants, has published the remarkable illustrated Bulletin 5004 showing a cross-section of a filtration plant in diagram, with appended photographs of the Infilco equipment, which can be supplied for the satisfactory and economical operation of the various parts of the plant illustrated.

THE CONSTRUCTION OF BETTER BITUMINOUS HIGHWAYS

634. In an illustrated booklet, "The Inevitable—," Sam E. Finley, North Avenue and Plum St., N. W., Atlanta, Ga., discusses the correct definition of the ideal road and how the ideal road becomes attainable and therefore inevitable. This booklet is replete with photographs of Finley Method bituminous roadways.

SAVINGS IN OIL PURCHASES

635. The Skinner oil reclaimer, which saves hundreds of dollars annually in the cost of new lubricating oil, and which reduces engine maintenance to a minimum, is discussed completely in literature which will be furnished gratis by Skinner Motors, Inc., 2231 Dalzelle St., Detroit, Mich., to municipalities operating automobile and motor-truck fleets.

SPECIFICATIONS FOR MAKING, PLACING AND CURING CONCRETE IN WINTER

636. Portland Cement Assn., Room 2312, 33 W. Grand Ave., Chicago, Ill., in its Folder M-110 has furnished specifications for making, placing and curing concrete in winter and for the protection of reinforced concrete work. Copies of this circular may be secured by any interested officials free on request.

COMPARISONS OF ROAD TAR CONSISTENCY

637. Koppers Products Co., Koppers Bldg., Pittsburgh, Pa., has published a valuable report discussing the relationship of road tar consistency determined by several methods and at different temperatures. This report will be of great help to contractors and municipal officials for it contains a consistency relationship chart which readily converts a consistency determined by one method to the corresponding consistency determined by another method. Copies of this report may be secured gratis from Koppers Products Co.

CAST IRON SERVICE BOXES

638. There is a big difference in service boxes, according to the Central Foundry Co., 420 Lexington Ave., New York, which will be pleased to send its new folder on Monitor service boxes with the "stay-on" cover.

WASHROOM ECONOMY AND SANITATION

639. A new folder illustrating and describing the advantages of group-washing fixtures for factories, schools and institutions of all kinds has just been issued by the Bradley Washfountain Co., 2205 W. Michigan St., Milwaukee, Wis., and will be sent free on request to any municipal officials desiring it.

GUARD-RAIL PROTECTION AT HIGH SPEED

640. Resiliflex road guard, a guard-rail unit made in standard panel lengths and post spacings of 16 feet, which has withstood the most severe punishment on highways and race tracks, is described in literature which may be secured from the National Traffic Guard Co., Atlanta, Ga.

SEWAGE DISPOSAL PLANT EQUIPMENT

641. In Bulletin 23-B11 Roots-Connersville-Wilbraham, Connersville, Ind., describe R-C-W heavy-duty blowers for activated sludge sewage treatment plants, Connersville meters for gas from sludge digestors, and R-C-W non-clogging centrifugal pumps for handling raw sewage.

GATE-VALVES BUILT FOR THE FUTURE

642. A new folder containing up-to-the-minute information about Ludlow gate-valves, designed for water-works service, in various sizes and of various materials, and fully complying with the specifications of the American Water Works Assn., has been published by the Ludlow Valve Mfg. Co., Troy, N. Y. A copy may be secured free on request.

EXTENDING THE LIFE OF YOUR CITY STREETS

643. The Texas Co., Asphalt Sales Dept., 135 E. 42nd St., New York, has recently published a booklet completely covering the subject of cold patch for repairing city streets. The Texaco cold patch booklet is well illustrated and designed to be of real help to street superintendents, city engineers and street commissioners.

VENTURI TYPE METERS AND RECORDERS

644. Simplex venturi type meters, which are accurate, reliable, simple, easy to check and adjust, are described in a recent bulletin which may be secured from the Simplex Valve & Meter Co., 6743 Upland St., Philadelphia, Pa.

PLANTS FOR REFUSE DISPOSAL

645. The Refuse Disposal Division, The C. O. Bartlett & Snow Co., 6210 Harvard Ave., Cleveland, Ohio, will furnish complete information to municipal officials on Sterling destructor plants for the incineration of mixed refuse. These high-speed, high-temperature incinerators require no fuel other than the refuse itself and have been installed in many large cities in North America.

WATER-WORKS CONTROL AND METERING EQUIPMENT

646. Venturi meters, rate of flow controllers, loss of head gages, rate of flow gages, water level gages, chemical feed regulators, and the Chronoflo electric fluid meter, are a few of the manifold products of Builders Iron Foundry, 9 Codding St., Providence, R. I., which are listed in its bulletin for water-works control.

A FLASHING NEON ILLUMINATED TRAFFIC SIGNAL

647. A logical modern traffic signal visible at a distance of one mile and legible at 500 feet has been announced by Lakewood Engineering Co., 520 Dublin Ave., Columbus, Ohio, and is described completely in its new Safety Neon Flasher Bulletin sent free on request.

PARK, PLAYGROUND AND AIRPORT FENCE

648. Anchor fences for many municipal uses, including parks, playgrounds, airports, water works, school yards, grounds of public buildings etc., are described completely with illustrations in Anchor Fence Manual No. 89, which may be secured from Anchor Post Fence Co., Eastern Ave. and Kane St., Baltimore, Md.

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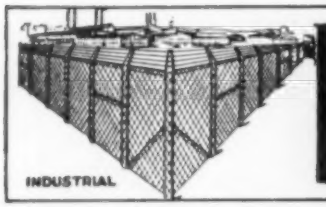

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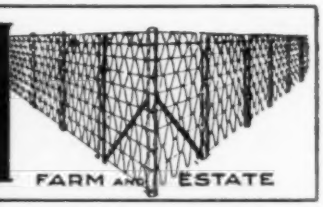

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AERATOR ~ MIXER

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Combined—Low-head Aerator and Thorough Chemical Mixer for your water treatment plant

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WATER TREATING AND STORAGE

Elevated tower tanks and tanks on concrete bases. Special fabrication of steel and alloy plate. Reliable consulting and designing engineering service. Write for bulletins.

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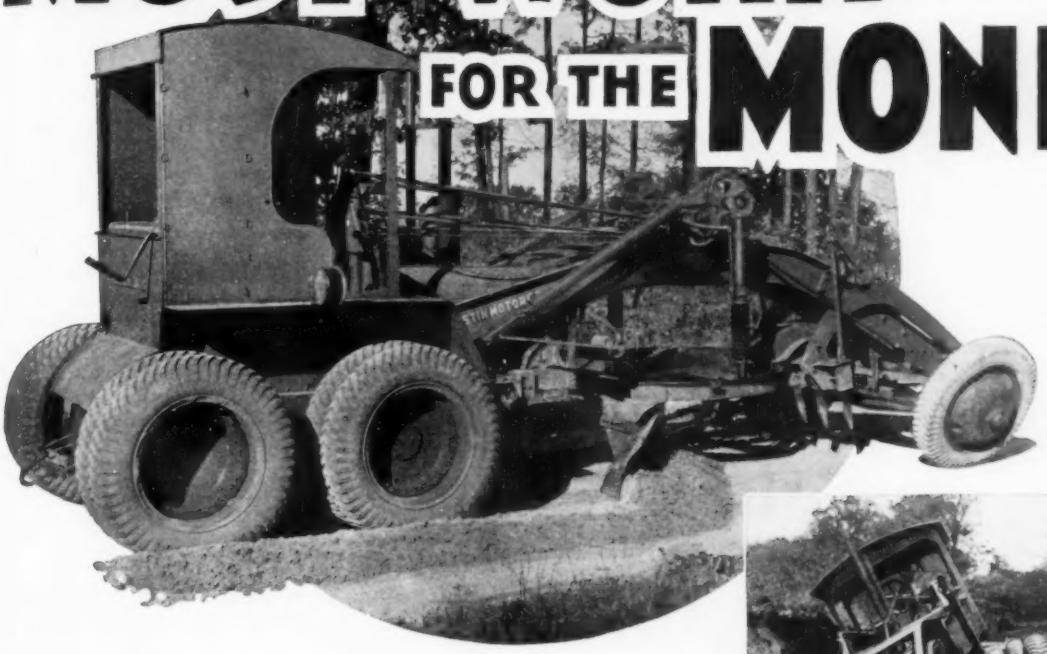

TOWNS, counties and contractors buy the "Austin 77"—because they can easily justify the expense for one machine when it does the work of five. Few can afford a motor grader for highway maintenance, a snow plow, and other machines for light ditching, scarifying and oil mix. But, in one purchase the "Austin 77" covers all these requirements. Every road contractor and highway or municipal official can afford to make it the next machine on his equipment list—for its all 'round usefulness. Let us explain in detail its "10 Points of Superiority". Send the coupon below today.

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400 N. Michigan Avenue
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ROAD ROLLERS, CRUSHING & SCREENING PLANTS, SCARIFIERS, SWEEPERS & SPRINKLERS, ROAD GRADERS, ELEVATING GRADERS, MOTOR GRADER DRAGS, SHO... ...NOUS DISTRIBUTORS WAGONS, SNOW PLOWS.

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Please send information on the ☐ Austin No. 77 Motor Grader.
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A new, well-tested formula for efficient, low-cost roads:—

T. R. C.

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L. L.

T. R. C. is that new and better binder for macadam roads—Temperature-Resisting Cement—so-called because of its remarkable ability to resist stresses caused by temperature changes. The road-building process is similar to that of a macadam road, but the completed structure is durable and the surface non-skid.

L. L. is the Local Labor which can be put to work on this extremely worth-while project—at low cost—the maximum proportion of the money allotted going for wages.

You will like the looks of these roads.

Your motorists will like to ride over them.

Your taxpayers will not grumble quite so loudly as usual over paying for them (the cost is so low for what you get).

And the roads will **last** and **LAST.**

For further information on this profitable bituminized-cement type of macadam road, write for our booklet telling of "European Practice," "American Experiments" and "Field Experience in Massachusetts."

T R C CORPORATION

Medusa Portland Cement Company, Licensee

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Cast Iron Pipe

for Water and Gas

Cast Iron Pipe and Special Castings, Bell and Spigot, Flange, Flexible Joint, Culvert, Milled and Plain End Tubes, Cylinders, Flanged and Bell and Spigot Fittings, High Pressure Fire Service Pipe, Warren Short Body Specials.

Size 2 to 60-inch

Pipe manufactured in accordance with standard specifications adopted and approved by water works associations and engineers.

Warren Foundry & Pipe Corp.

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WATER CONTROL

without floats or fixtures

A constant water level can be automatically maintained in reservoirs, tanks and standpipes by the use of

GOLDEN-ANDERSON Automatic Cushioned Controlling Altitude Valves

These valves are always cushioned in closing and opening. They are extensively used for automatically maintaining a uniform stage of water in reservoirs, tanks and standpipes. No valves inside. No floats or fixtures, inside or outside of tanks. No freezing troubles. Three ways of operating these valves:
1st—Automatically, by water
2nd—By electricity, if desired
3rd—Automatically work both ways in single line

Valves with an Absolute Guarantee

Detroit, Mich., Water Dept. has in use 5—24" Golden-Anderson Altitude Valves

30 of these ALTITUDE VALVES in sizes 6" to 24" serving the City of Los Angeles, Calif., now

NEW HAVEN WATER CO., NEW HAVEN, CONN., HAS 2—24"; 1—16"; 2—12"; 1—10"; 1—8" ALTITUDE VALVES IN SERVICE.

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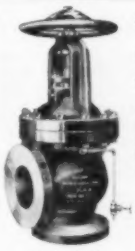

Pat. Automatic Double Cushioned Triple Acting Non-Return Valves

1. Prevent shut-down due to reversal of steam flow.
2. Instantly close and isolate a boiler when a tube bursts.
3. Cut off steam flow from every boiler instantly when a steam pipe ruptures.
4. Automatically cut a boiler into line.
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6. The only valve that can be tested in service.

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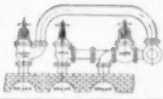


2 Valves in One

Angle, Globe or Elbow

Patent Automatic Cushioned Controlling Float Valves

They carry a constant water level in feed water heaters by perfectly controlling the flow of makeup water.

Operated by protected enclosed copper float.

Cushioned by both air and water.

Operate without hammering, sticking or chattering. No metal to-metal contacts. Made angle or straightway.

Sizes 1 in. to 24 in.

Pat. Cushioned Water Relief Valves

1. Automatically relieve excess pressure.
2. Prevent stress, strain and bursting of mains.
3. Correct mechanical construction.
4. Perfect air and water cushioning.
5. No metal-to-metal contacts. No hammering or shocks.
6. Angle and globe pattern. Sizes 2 in. to 24 in.

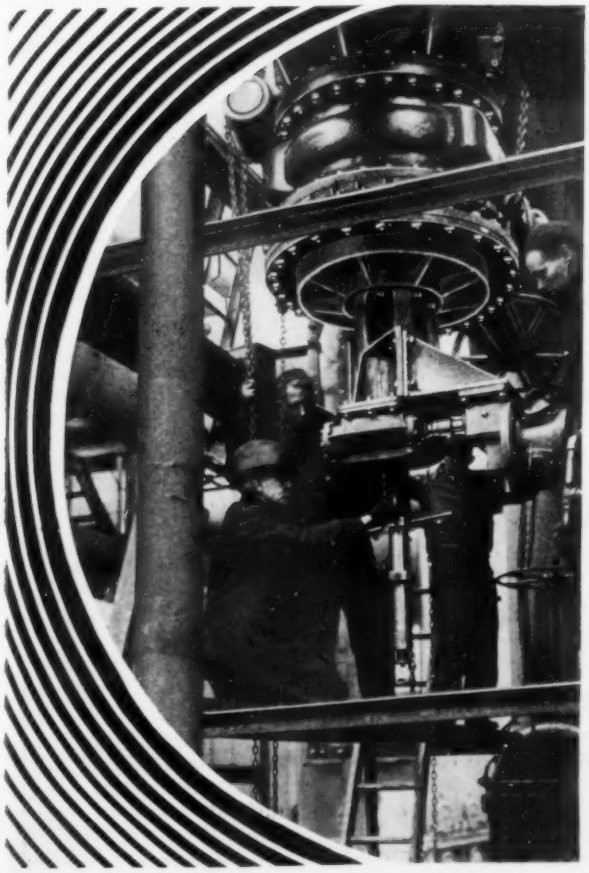
Pat. Automatic Cushioned Water Float Valves

1. Automatically maintain uniform water levels in tanks, standpipes, etc.
2. Instantly adjusted to operate quickly or slowly.
3. Float swivel to any angle—most satisfactory float valve known.
4. No metal-to-metal contacts—no water hammer or shock.
5. Cushioned by air and water.

½" to 24" Angle or Globe

Pat. Automatic Cushioned Water Pressure Regulating Valves

1. Maintain a constant reduced pressure regardless of fluctuations on high pressure side.
2. Perfectly cushioned by water and air. No metal-to-metal contacts.
3. The best valve made for maintaining a constant low pressure where consumption is continuous.
4. Operates quickly or slowly as required—No attention necessary.
5. Positively no hammering or sticking. Sizes ½ in. to 24 inches.



UNDER-PRESSURE
30" TAP MADE UPWARDS
INTO 48" MAIN
20' ABOVE GROUND

THE illustration shows a Smith Tapping Machine recently making an unusual and difficult 30" tap upwards for a branch connection into the bottom of a 48" main, with the latter at all times under full pressure, located 20' above ground.

The actual cut was made in less than one hour, with the pipe continuously furnishing service to a large population.

SMITH TAPPING MACHINES

—are today standard equipment with water and gas services. They come in various sizes from 2" to 42" inclusively. In the larger sizes, it is customary to rent them, accompanied by our own experienced operators.

The A. P. SMITH MFG. CO.
East Orange, New Jersey

KENNEDY

VALVES-PIPE FITTINGS-FIRE HYDRANTS

Gate, Globe, Angle and Check Valves furnished for a wide range of sizes and pressures, and arranged for manual, gear, cylinder, or electric operation. Water Gates and Fire Hydrants built to American Water Works Association specifications. Underwriters' approved Gate Valves and Post Indicators. Cast Iron Flanged Fittings and Flanges, Malleable Iron and Brass Screwed Fittings. *Send for Catalog*

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LOCK JOINT
Reinforced
Concrete Pipe
PRESSURE - SEWER - CULVERT
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FOR WATER AND GAS

ALSO SPECIAL CASTINGS AND FLANGE WORK

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Tapping Sleeves, Tapping Valves, Crosses, Split Repair Sleeves, Post Indicators, Floor Standards, Air Valves, Valve Boxes, Grease Cases, Etc.

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TROY NEW YORK

Enjoy a 4 STAR HOTEL in New York

1400 large rooms... each with bath *(tub and shower)* servidor and radio.

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★ *for* **RECREATION**...69 fine theatres within 6 blocks. 1 block from Broadway... 4 short blocks to Madison Square Garden.

★ *for* **QUIET SLEEP**... Our 32 stories of fresh air and sunshine assure you quiet comfort at all hours.

Breakfast *from* 30c Luncheon *from* 65c
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Readers of THE AMERICAN CITY desiring to secure catalog or price lists on any sort of machinery equipment or supplies for municipal or county work are invited to state their wishes to the Catalog and Price List Department, The American City, 470 Fourth Ave., New York. One letter to us will secure you the information you desire free of all charge, and at a considerable saving of time and correspondence.

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It goes places...easily. Around rock . . . root . . . sewage drain...Nothing ever stands in the way of copper service tubing—because it detours around. It's flexible. *It can be bent easily around obstructions.* It's easy and economical to install. Comes in long lengths. Fewer joints . . . and copper doesn't rust. Can't rust. Resists soil corrosion . . . Once in, it *stays* in. It's lasting, efficient, economical. That's why it's being specified in up-to-date regulations and codes. Write for information.

Copper SERVICE Tubing

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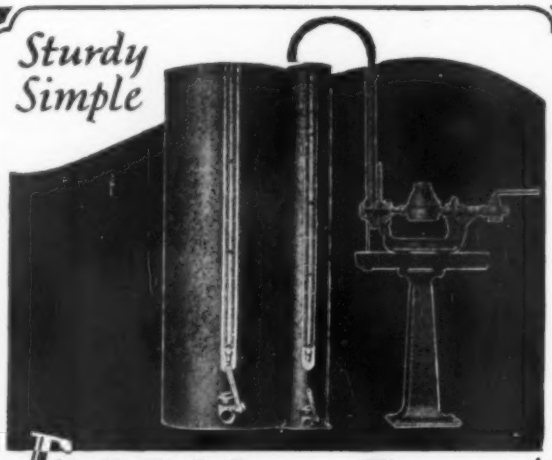
Sturdy Simple



FORD Meter Tester!

AN UNTESTED water meter is an unknown quantity and yet its reading serves as a basis for your charge to the customer. If it has seen much service the chances are it is very inaccurate. Regular and frequent checking up of meters is necessary to assure your income. Ford Meter Testers provide accurate and convenient testing of water meters at a moderate cost.

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WATER METER SETTING & TESTING EQUIPMENT

The FORD METER BOX *Co.*

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The EDDY Hydrant

Eddy Fire Hydrants have many points that appeal to water-works men. For example:

A damaged valve can be replaced in a few minutes at slight expense.

Should the standpipe be broken, not a drop of water need be lost.

All hydrants are frost-proof.

These and many other points of excellence are thoroughly explained in our catalog, which it will pay you to study.

Also manufacturers of the well-known Eddy Valves

EDDY VALVE COMPANY

WATERFORD NEW YORK

Representatives

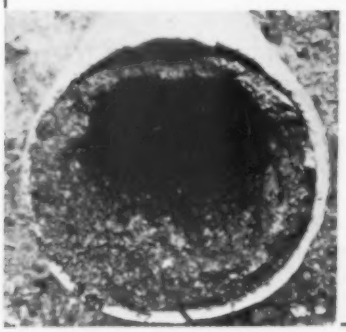
Jas. B. Clow & Sons, Chicago, Ill.
National Cast Iron Pipe Co., Birmingham, Ala.

LITTLE TALKS ON WATER WORK ECONOMY

— No. 9 —

Smiles on the faces of the newly employed—paying jobs instead of the dole—these are "all to the good." But this is a time of great responsibility for the city's leaders. Sentiment must not be allowed to run away with economy, or we'll be a long time paying the bills! So far as possible, projects must be chosen that will be "self-liquidating." Such a project is CLEANING THE WATER MAINS by THE NATIONAL METHOD. If water pressure gets low in your city, clogged mains are very likely to be the cause; and the longer the job is postponed, the more money will have to be spent for such items as new mains to augment the supply, increased coal bills, increased wear and tear on the pumps, etc. SO—WHY NOT NOW—

Put your local unemployed to work on cleaning the mains



We furnish the superintendent to take charge, an expert pipe fitter and the equipment. *Let us give you an estimate.*

NATIONAL WATER MAIN CLEANING CO.
50 Church St., N. Y. C.

THE NATIONAL METHOD

Portable Asphalt Maintenance Plants

A PORTABLE UNIT WITH A CAPACITY OF 400 YARDS PER DAY

ACCURATE CONTROL OF MATERIALS ASSURING ACCURATE MIXTURE TO COMPLY WITH ANY STANDARD SPECIFICATIONS

Send for Bulletin R-400

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Stationary — Railway — Portable and Semi-Portable Plants

Just think ... a modern, new hotel, in the heart of New York—200 feet from Broadway, on 45th Street. A room and bath for one, $2.50; for two, $3.50.

It's the PICCADILLY

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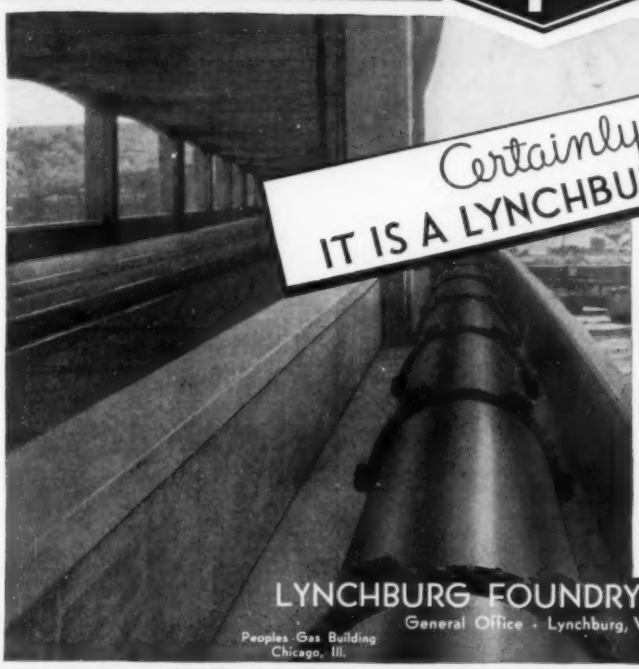

Certainly
IT IS A LYNCHBURG FOUNDRY JOB

36"—TWELVE FOOT
Shouldered ends Cast Iron Pipe;
Machined for Victaulic Couplings

A difficult job—but one that richly deserves the praise of the many engineers who have made special trips to see it . . . to study it . . . For sturdy permanency, Cast-Iron Pipe was selected—because of line deflection and excessive vibration, Victaulic Couplings were used—and of course, the Lynchburg Foundry Company with more than half a century of experience furnished the pipe

Bell and Spigot Pipe and Fittings. From 4" to 54"
Cast Iron Flanged Pipe. From 3" to 84"
Cast Iron Flanged Fittings and Flanges from 1" to 84"
de Lavaud Centrifugal Cast-Iron Pipe

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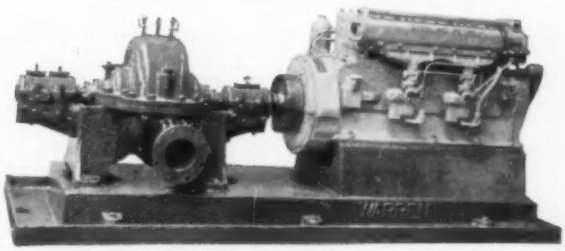
Prompt Deliveries on Special Fittings

BETTING OUR DOLLARS
that the product is right

Sterling High Duty Internal Combustion Engines

Sterling — The Engine of Refinement

12 to 565 B. H. P.
Gas or Gasoline



For fire service at Florence, N. J., a Petrel 6-cylinder, 95-Hp., 1300 R.P.M. engine direct connected to a 6-inch, 2-stage Warren centrifugal pump.

When only one engine builder has consistently advertised for many years, that the engine can carry peak loads and perform quickly and reliably for standby service, there must be something unusual about the duty. Buy a well-advertised product and avoid its orphanage. All strong American companies and all good products are advertised.

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Are the small demands of your large consumers accurately measured? They are—if the Badger Compound Meter is on the line . . . The Badger Compound is a money maker for you. Combining the advantages of the Disc and Turbine Meters, it is sensitive to the smallest leak and accurate on the largest flow.

Like all Badger Meters value is "built into" the Badger Compound. It is rapid and positive in its compounding valve action at the cross over point between the Disc and Turbine Meters and it absorbs an insignificant part of the effected pressure. The cross over point is regulated by volume flow and not by pressure variance.

Know Badger Meters better—send for bulletin No. 800 which describes the Compound Meter in detail.

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MILWAUKEE, WISCONSIN

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BADGER Water METERS

SEND FOR *this* NEW FOLDER

It contains up-to-the-minute information about Ludlow Gate Valves, designed for water works service.

Sizes, design, materials, etc., are fully covered. All valves fully comply with specifications of American Water Works Association. Send today for your copy.

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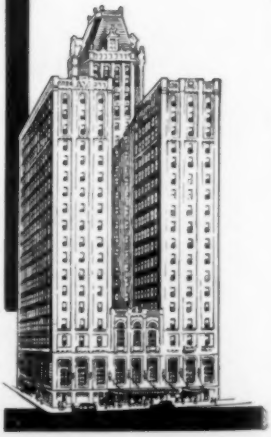
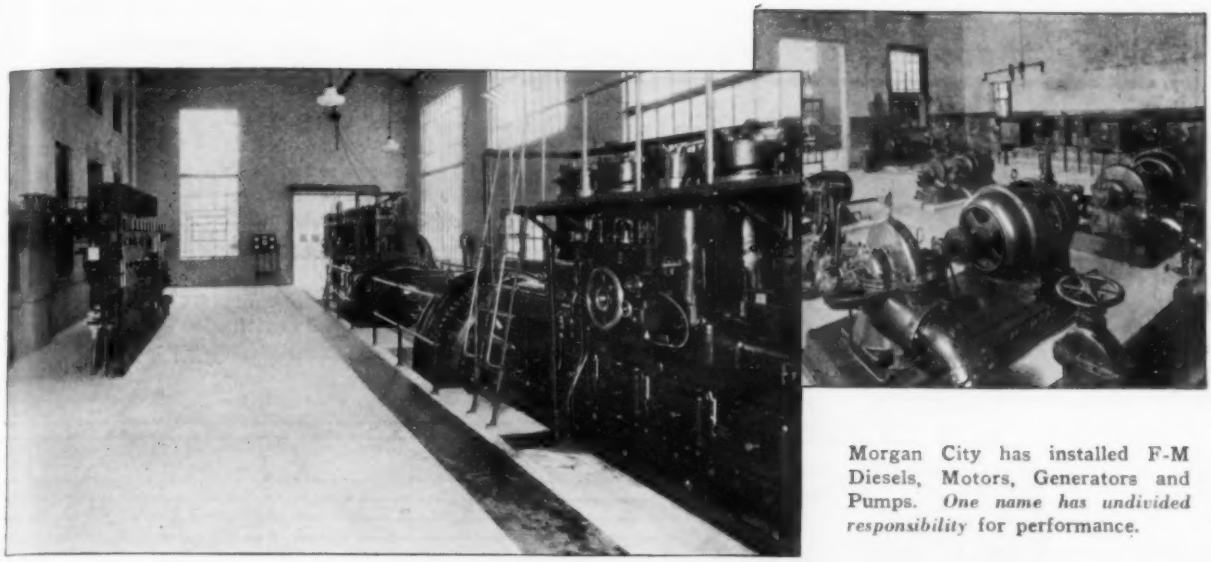


WALTER L. JACKSON - *MNG. DIRECTOR*

BALTIMORE
MARYLAND



Morgan City has installed F-M Diesels, Motors, Generators and Pumps. *One name has undivided responsibility* for performance.

Morgan City decides to "cash in" in its own market

Morgan City, Louisiana, (pop. 6000), has a new light plant and waterworks. And both plants are the last word in engineering design and construction. They are the last word in equipment that will give lowest cost service.

For *both* light and water plants are designed to make money for the city so that taxes and rates for the citizens can be lowered!

The light plant employs two 630-hp. F-M Diesels driving F-M Alternators. The water plant is composed of F-M Pumps driven by F-M Motors. Morgan City bought an F-M job throughout to secure the undivided responsibility for performance that only F-M can give on installations of this kind.

Morgan City and its citizens will profit from the results of this F-M specialized service for cities. Officials and citizens of any city can secure full information on the part F-M Diesels, Pumps and Motors are playing in solving the financial problems of municipalities little and big.

Address Fairbanks, Morse & Co., 900 S. Wabash Ave., Chicago, Illinois, or nearest branch.

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DIESEL ENGINES

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POWER PUMPING AND WEIGHING EQUIPMENT

When shopping for stops, couplings and fittings, consider:—

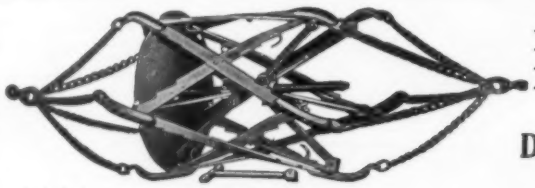
The Farnan Brass Works Company has been furnishing dependable, guaranteed brass stops, couplings and fittings to satisfied customers for eighty-one years.

The Farnan Brass Works Company has large stocks—in all types and sizes—all tested with 200 pounds hydraulic pressure—and all unconditionally guaranteed.

FARNAN BRASS WORKS COMPANY
CLEVELAND OHIO

STOPS COUPLINGS FITTINGS

Write for information and prices. Our prices are right, too!



Patented

"We consider the Machine a very valuable and satisfactory one for cutting roots and cleaning out sewers of any size, and do not hesitate to recommend it."—Jesse Weist, Street Commissioner, Bluffton, Indiana.

EXPANDING SEWER MACHINE CO.
Nappanee, Indiana

Do You Want Efficiency in Your Sewer System?

Then use

THE EXPANDING ROOT CUTTER AND SEWER CLEANER,

which finds no sewer too clogged to clean thoroughly. Take advantage of the *30 days' trial* offer, which gives your city an opportunity to determine results and the actual economic cost. Write for catalog on complete line of sewer cleaning equipment.

NATIONAL METERS
EMPIRE · NASH · CROWN · GEM
EMPIRE-COMPOUND · PREMIER
NATIONAL METER COMPANY

National Meters cost least in the long run. They require only a minimum of attention, adjustment, or repair expense. They are lastingly accurate, extremely sensitive to small flows, and thoroughly reliable in every respect. For maximum net revenue from metering, standardize on National Meters.

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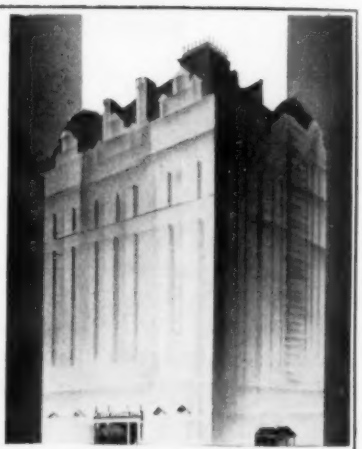
THE STANDARD FOR 50 YEARS

Automatic Pressure Control Valves
Feed Water Filters Portable Fire Hydrants
Hydraulic Engines Hydraulic Booster Pumps

ROSS VALVE MFG. CO., INC.

ARCHIBALD STREET TROY N. Y.



truly *The* Bellevue-Stratford

is a home-in-Philadelphia . . . not only for those who enjoy residence here the year 'round but as well for the many who return to the Bellevue again and again. In the heart of the business and financial district, only a few minutes from the best in concerts, plays, football—the Bellevue-Stratford combines accessibility with quiet luxury. . . . May we offer you Bellevue-Stratford hospitality? . . . at 1933 low prices of course.

CLAUDE H. BENNETT, *General Manager.*

PHILADELPHIA

During December we hope you will remember to mention THE AMERICAN CITY.

WHICH ONE IS TO Blame?

NEITHER, perhaps. Too often the responsibility for winter driving accidents goes back to the officials whose duty is to make the highways safe.

Ice control should begin now — *before* the severities of freezing weather reach their height. Preparing stock piles of sand and cinders isn't enough. Prevent them from becoming frozen masses in themselves—so they are sure to be "spreadable" when needed; and to keep the material from blowing away when it is spread. . . . Treat with Calcium Chloride and you accomplish both these necessary steps toward efficient ice control.

Calcium Chloride mixed—either in flake form or solution — with sand and cinders keeps them ready to do business instantly and effectively. Its inherent properties also enable them to "dig in"—to provide a sure-footed tractive surface. It melts into the ice — even at sub-zero temperatures.

Don't skimp on ice control . . . one single serious accident may be more costly than many tons of "prevention." Make your roads and streets safe—not just within the pale of official responsibility, but as safe as is humanly possible. Include Calcium Chloride in your grit mixtures.

For complete data on the use of Calcium Chloride for ice control, write to any of the following members of this Association.

CALCIUM CHLORIDE ASSOCIATION

MICHIGAN ALKALI COMPANY....10 E. 40th St., New York City
SOLVAY SALES CORPORATION....61 Broadway, New York City
THE DOW CHEMICAL COMPANY.....Midland, Michigan
THE COLUMBIA ALKALI CORPORATION.....Barberton, Ohio

CALCIUM CHLORIDE FOR BETTER ICE CONTROL

Pittsburgh Fence

The ideal enclosure for sewage disposal plants, water works, electrical equipment, parks, playgrounds and school yards. We will gladly submit specifications and estimate of cost of fencing any piece of property.

PITTSBURGH STEEL COMPANY
Union Trust Building
Pittsburgh, Pa.

Carey Elastite EXPANSION JOINT

makes *Good* Paving *Better*

The "sandwich" joint which protects concrete paving against expansion and contraction stresses. Proved by 20 years' use in highways and sidewalks in all parts of the world. Large stocks in principal cities insure immediate shipment. Write for catalog and 1933 prices.

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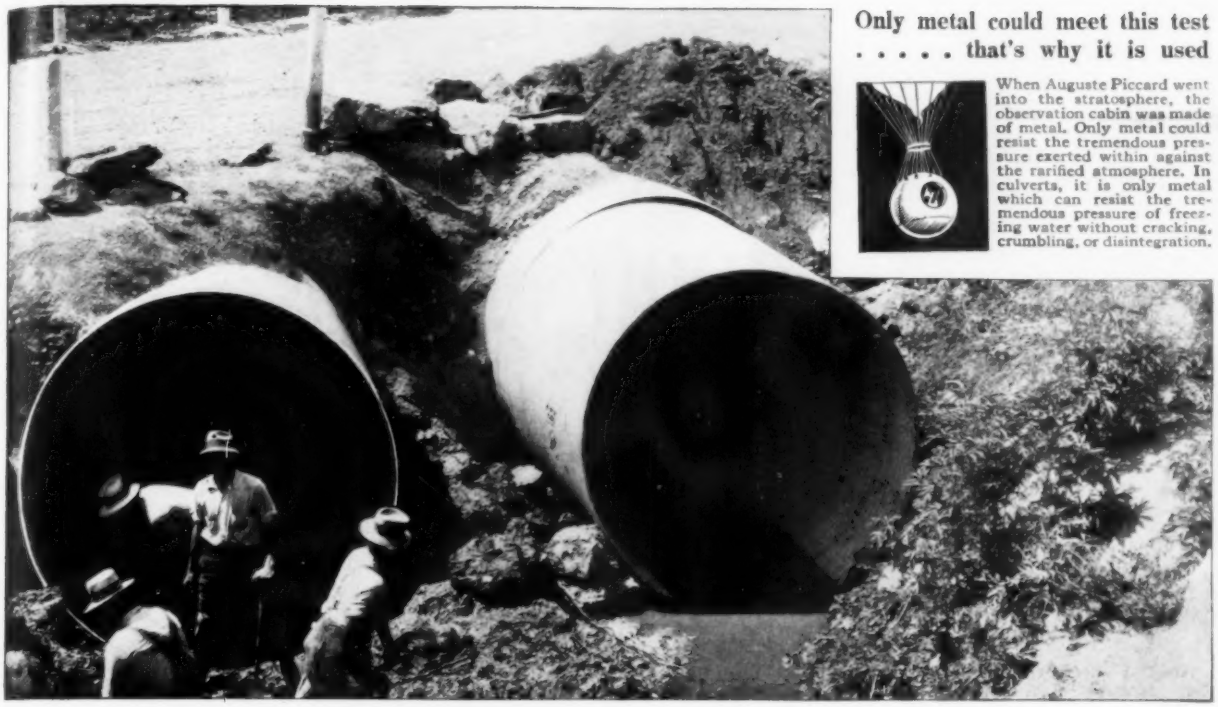

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measures to be taken should be determined by men thoroughly experienced in shore-protection engineering. Considerable sums have been wasted by building structures that have proved totally inadequate. Only structures of adequate size, strength, and stability, of correct design and of proper materials, can be expected to withstand successfully the attacks of the ocean over any considerable period of time.

Typical steel-sheet piling groin.

As the backbone of a permanent, effective system of shore protection, interlocking steel-sheet piling offers properties of decided interest to designers and owners of bulkheads, groins and similar structures. Bethlehem (Lackawanna) Piling has been widely used in this class of work. The principal advantages that it offers are as follows:

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and other sea worms whose ravages are rapidly increasing in northern waters.

It is the strongest material available for the building of shore-protection structures. It gives greater stability to bulkheads and groins, because the specific gravity of steel is so high that structures of steel-sheet piling are unlikely to be loosened by the buoyant effect of waves.

Bethlehem (Lackawanna) Piling, properly installed, results in bulkheads and groins that are neat, clean-cut and attractive in appearance.

In addition to its use in the construction of bulkheads and groins, Bethlehem (Lackawanna) Piling has other important applications in shore protection. For example, masonry or concrete sea walls are often undermined by heavy seas, resulting many times in their destruction. This can be prevented by placing a sand-tight cut-off wall of Bethlehem (Lackawanna) Piling at the toe of the wall.

Another important use of Bethlehem (Lackawanna) Piling is to form a tight core wall in a rock jetty used for beach protection. This core wall is usually necessary to prevent the passage of sand and water through the jetty, which could easily result in undermining the structure

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This booklet is well worth the attention of engineers, contractors, municipal officials — everyone concerned with planning or building shore-protection structures, either on the ocean or on inland waters. We'd like to send you a copy. Please fill in and mail the coupon. The booklet will come to you by return mail.

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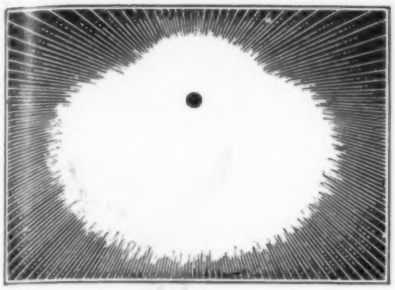

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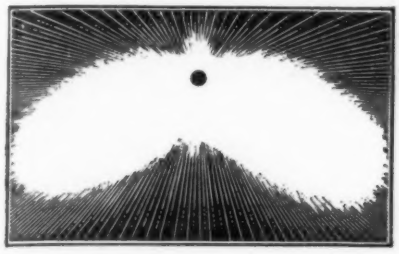
Units at curb—closely spaced



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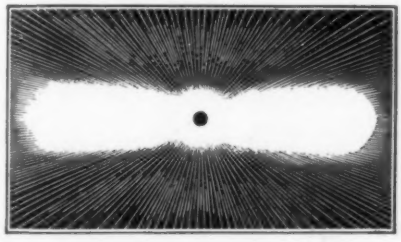

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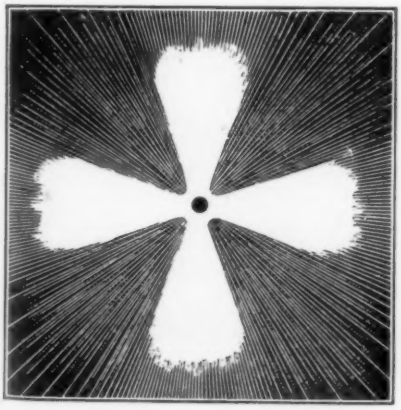
A long narrow ribbon of light



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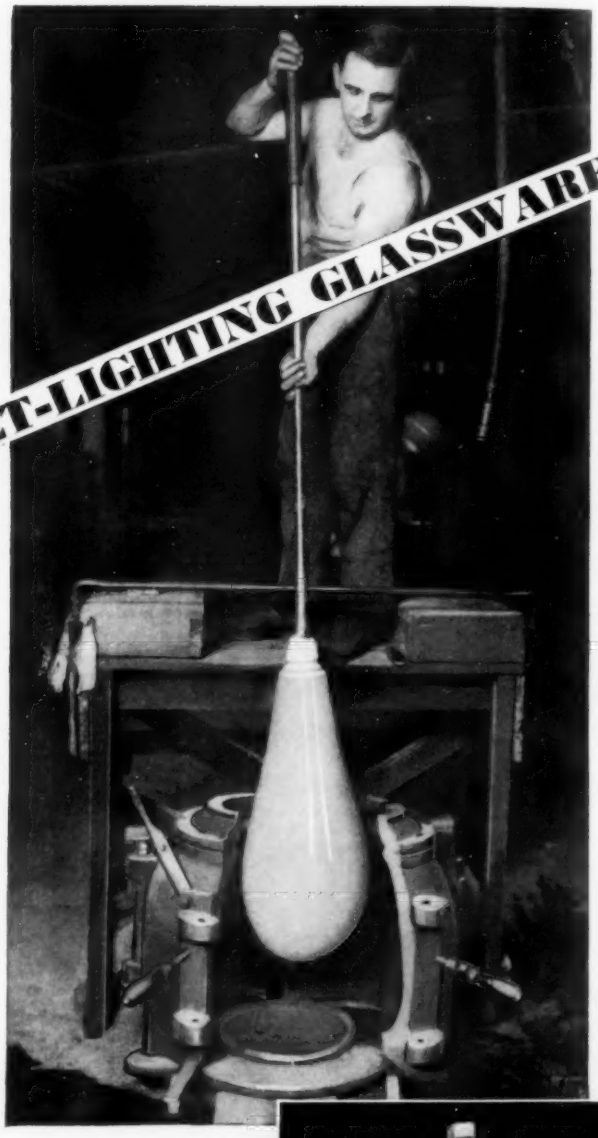

Gleason - Tiebout glass-blower placing a ball of semi-molten glass into a mold for a street-lighting globe

ONE of the important factors in the design and manufacture of good street-lighting glassware is high efficiency — the ability to transmit the maximum quantity of light. This must be accomplished without any tendency toward glare.

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41 per cent of night accidents in Ontario result from insufficient lighting

SO reports Osborne A. Mitchell, editor of *Electrical News and Engineering*. He continues:

". . . darkness, or inadequate illumination, is one of the greatest of hazards and is responsible for more accidents and more deaths on our highways than perhaps any other one factor.

". . . half the rural highway accidents occurring after dark are directly due to the driver, or drivers, not being able to see clearly.

". . . although fewer cars travel at night, the fatalities are heavier than during the daytime.

". . . A conservative estimate of the total waste [of accidents] places the figure for Ontario at approximately fifteen million dollars [in 1932].

". . . If, by improving the lighting on city streets, and by illuminating some of our more travelled highways, we can greatly reduce this large economic loss, we shall at least be making a truly dividend-paying investment."

Such is the report after a survey of all traffic accidents in the Province of Ontario. It is only another example of the relationship between inadequate lighting and traffic accidents. By mailing the coupon at the bottom of this page, you can obtain a copy of Mr. Mitchell's article, "Darkness Brings Death," which appeared in *Electrical News and Engineering*. Let General Electric engineers help you plan a lighting program for your city streets and county highways.

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The Municipal Index

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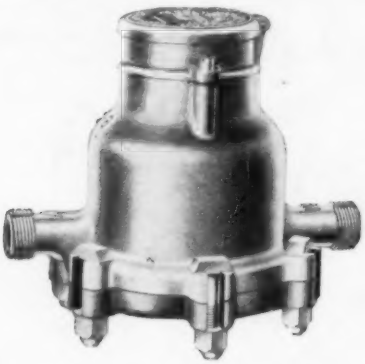

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